A Preliminary to War

The 1st Aero Squadron and the Mexican Punitive Expedition of 1916

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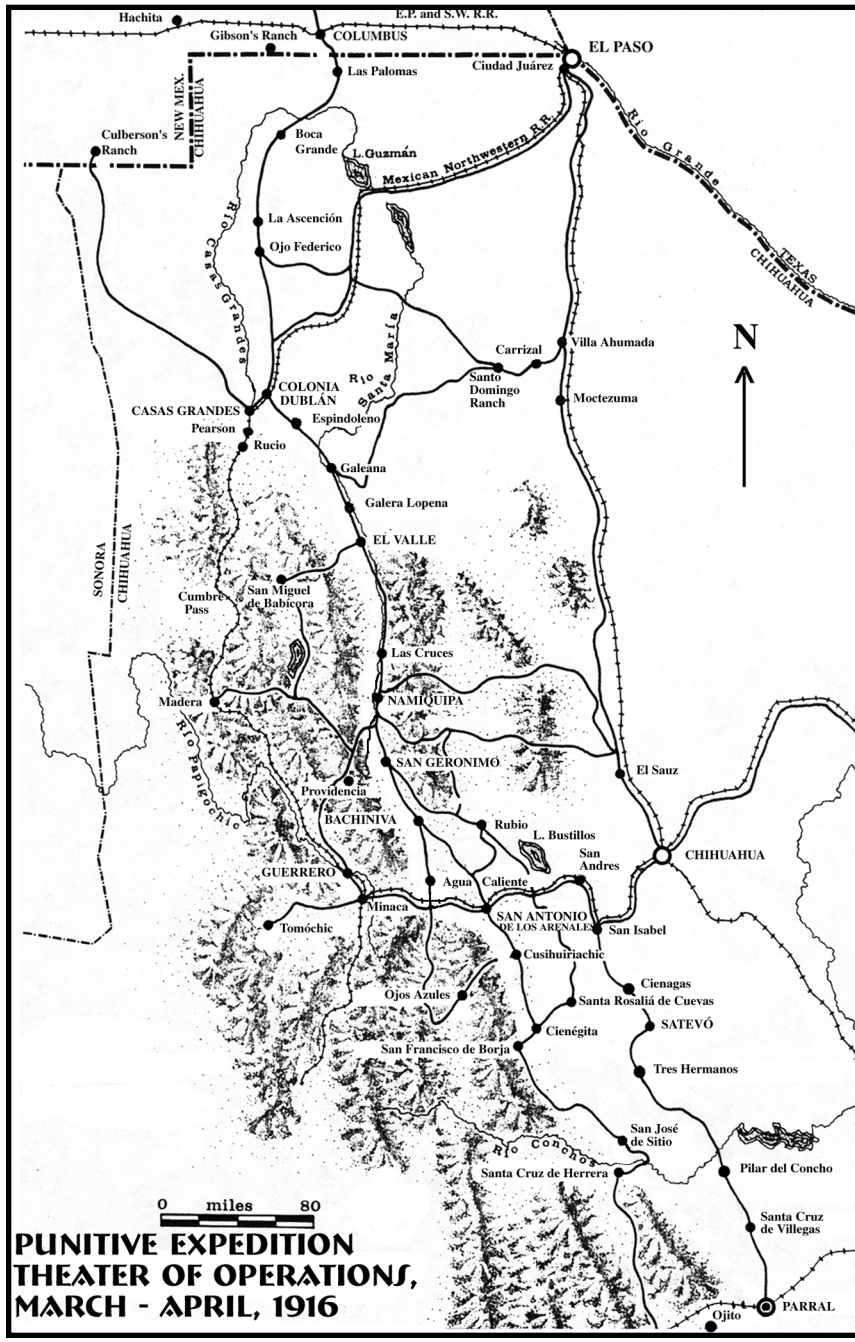
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PUNITIVE EXPEDITION
THEATER OF OPERATIONS,
MARCH - APRIL, 1916

Introduction

On March 15, 1916, the 1st Aero Squadron arrived at Columbus, New Mexico, its train steaming into the crowded, chaotic town at 9:15 in the morning. Led by Capt. Benjamin D. Foulois, a lantern-jawed, bantam-weight former enlisted man, the squadron included eleven officers, eighty-two enlisted men, and one civilian technician. Under Foulois's direction, the men unloaded an automobile, six motorcycles, and twelve motor trucks, vehicles rare in 1916 New Mexico and even rarer in an army still wedded to the horse and mule. These were followed by wooden crates containing eight wood, wire, and fabric Curtiss JN–3 biplanes, every airplane owned by the U.S. Army, save those assigned to its aviation school at San Diego, California. The squadron was in Columbus to join an expedition commanded by Brig. Gen. John J. "Black Jack" Pershing. President Woodrow Wilson had ordered Pershing's force into Mexico in response to a March 9 attack on the tiny border town by the Mexican desperado, Francisco "Pancho" Villa. The event was auspicious. For the first time, the U.S. Army's entire air force—the 1st Aero Squadron—had deployed for an active campaign.

The course of the Punitive Expedition can be quickly summarized. Pershing's forces crossed into Mexico on March 15, 1916, and for the next month, several carefully coordinated cavalry columns pressed southward through the state of Chihuahua in an effort to locate Villa, while trying to avoid confrontations with troops loyal to the Mexican government, who were unhelpful at best and often downright unfriendly. Behind the cavalry, the expedition was supported along a lengthening line of communications extending from Columbus through bases at Colonia Dublán, Namiquipa, Bachíniva, San Antonio de los Arenales, and Satevó, the last over three hundred miles from the United States. The hard-riding cavalry ultimately reached Parral, another seventy miles south of Satevó, where a fight with Mexican government forces on April 15 marked the southern terminus of the American advance. Subsequently, at the limit of his logistic capability and concerned about threats to his extended line of communications, Pershing assumed a defensive posture. He organized the area controlled by the Punitive Expedition into districts, each patrolled by a cavalry regiment that harried guerrillas and kept an eye on government forces. Pershing maintained this position until the Punitive Expedition withdrew from Mexico early in 1917.[1]

The 1st Aero Squadron played a significant role in the Punitive Expedition, but, in dramatic contrast to how an air force functions today, it served as a means of communication and observation, not as a combatant arm. Some experiments with bombs and machine guns had been conducted, and the war in Europe was quickly turning the airplane into a serious weapon of war. Nevertheless, U.S. Army leaders envisioned aviation's primary mission to be the receipt and trans-

mission of information for tactical commanders and long-distance scouting as an adjunct to the cavalry. Accordingly, during the mobile phase of the Punitive Expedition, the 1st Aero Squadron enabled Pershing to locate and communicate with his widely dispersed, fast-moving columns and carried dispatches between Pershing's main and advanced bases. The squadron also scouted for hostile forces and kept a watch for threats to Pershing's line of communications. As will be seen, these efforts were made in some of the worst weather and poorest conditions imaginable, and by the end of April, all eight airplanes had been destroyed. During the static phase of the Punitive Expedition, the 1st Aero Squadron remained at Columbus, where Foulois and his men operated a test and evaluation program for a wide variety of airplanes and aviation equipment. During both phases of the campaign, the officers and men of the 1st Aero Squadron learned lessons about airplanes, equipment, and operations in the field that would be applied in France less than a year later.

The Mexican Revolution

Villa's raid on Columbus grew out of the turmoil of the Mexican Revolution, which had begun some six years earlier. Gen. Porfirio Díaz had seized control of Mexico in 1876 and established a dictatorship that had ensured long-term stability. Under his rule, powerful elites of the army, the Catholic church, and the land-owning class dominated the government, while foreign investors—who paid extravagantly for the right—controlled Mexico's mining and industry. Most of the population consisted of poverty-stricken, uneducated peons, and Díaz ruthlessly crushed any effort that might improve their lot or pose a threat to the established order. By 1910, however, the dictator was old, Mexico was ripe for change, and a young liberal lawyer, Francesco Madero, succeeded in uniting disparate opposition groups into a single movement. Scattered fighting broke out in November, and in March 1911, the insurgents forced Díaz into exile. Madero could inspire revolution, but proved unable to govern. His reforms were too conservative for some leaders, like Emiliano Zapata, and too liberal for others, like Pascual Orozco, Jr. Bloody fighting soon broke out across Mexico, and Madero turned for support to Gen. Victoriano Huerta, a hard-drinking but competent soldier. Huerta crushed Orozco and kept Zapata at bay, but he had as little respect for Madero as they did. In February 1913, Huerta seized the government. Madero was arrested and shot, supposedly while trying to escape.[2]

Huerta's rule was short-lived. In March, Venustiano Carranza, the governor of the northern state of Coahuila, formed a "Constitutionalist" movement and declared himself "First Chief" of the Constitutionalist army. Others quickly joined Carranza. Among them was a former mechanic and teacher from Sonora, Álvaro Obregón. Another was a superb horseman, charismatic leader, and already legendary bandit and guerilla, Francisco "Pancho" Villa of Chihuahua. Meanwhile, the state of Morelos provided a base for Zapata, the unconquered hero of the peon. The Constitutionalists forced Huerta into exile in mid-July 1914 and seized Mexico City. However, Carranza, jealous of Villa's flamboyant

popularity, allowed Obregón the honor of entering the capital first. By December, a resentful Villa had combined with Zapata against Carranza. The highly capable Obregón remained loyal, however, and by July 1915 had driven Zapata back to Morelos and shattered Villa's *Division del Norte* in a series of pitched battles. Villa and the remnants of his army retreated to his stronghold in Chihuahua on the U.S. border, harried by Carrancista troops.[3]

Villa was popular in the United States, where President Woodrow Wilson thought he could do business with him, and where—thanks to sensationalist newspaper accounts—the public considered him a Mexican version of Robin Hood. In October 1915, however, Wilson formally recognized Carranza as President of Mexico and embargoed arms shipments to Villa. Furious with what he saw as Wilson's perfidiousness, the shrewd and devious guerrilla began looking for revenge and a way to entice the United States to intervene in Mexico, a step that might allow him to act as a patriot, while branding Carranza a lackey of the hated gringos. Apparently as early as January 1916, Villa began considering an attack on Columbus, a small town consisting mostly of adobe and wood-frame buildings only three miles inside the U.S. border.[4]

On the night of March 8, 1916, Villa led some five hundred men against Columbus and nearby Camp Furlong, headquarters for the 13th Cavalry Regiment. In the pitch dark, his men achieved surprise, penetrated to the center of town, and burned several buildings. The 13th Cavalry reacted quickly, however, blunting the attack on Camp Furlong and driving the raiders out of town. A detachment under Maj. Frank Tompkins, a hard-nosed veteran of the Indian wars, chased the retreating raiders several miles into Mexico. Eighteen Americans, including ten soldiers, were killed. Over sixty-five of Villa's men died, among them a twelve-year-old boy taken out of school by his father for the raid.[5]

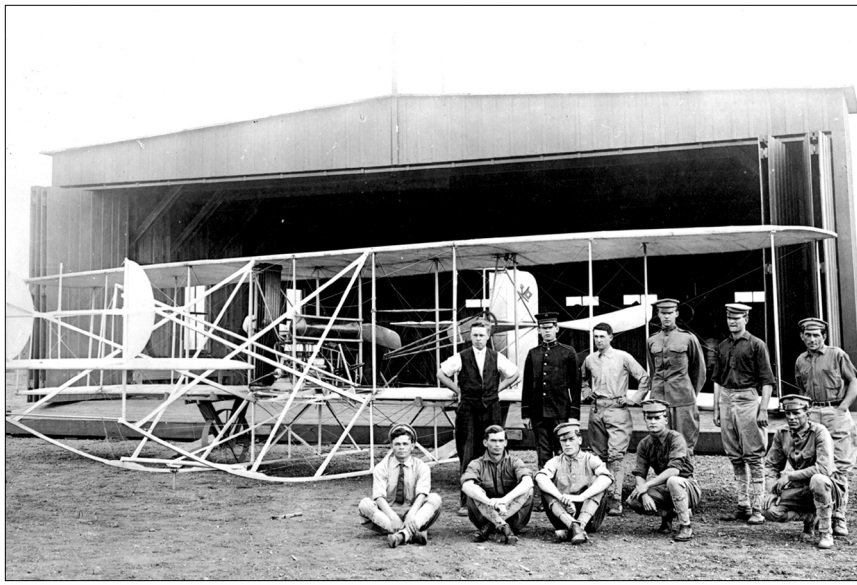
Reaction was immediate. Word reached Washington, D.C., within hours of the attack, and on March 10, Maj. Gen. Frederick Funston, commander of the U.S. Army's Southern Department at Fort Sam Houston, Texas, sent a message urging a relentless pursuit of Villa's force. President Wilson and his Cabinet met that morning and agreed unanimously that Villa had to be brought to justice for the raid on Columbus, as well as for the murder of seventeen American mining engineers at Santa Isabel on January 10. Wilson's public words pointed the army at Pancho Villa; however, thanks to counseling from the canny old chief of staff, Maj. Gen. Hugh Scott, the orders issued by Secretary of War Newton D. Baker, who had just taken office, directed the army only to pursue and disperse the band of raiders that had attacked Columbus, not capture or kill its leader.[6]

Command of the expedition went to "Black Jack" Pershing, a veteran cavalryman with a proven record against insurgent Apaches and Filipino guerrillas. A strict disciplinarian, Pershing combined mature judgment, political sensitivity, and aggressive leadership, characteristics that would serve him well in the coming months. Funston gave Pershing the 7th, 10th, 11th, and 13th Cavalry; the 6th and 16th Infantry; and two batteries from the 6th Field Artillery for his command. To these, Funston added two companies of engineers; two wagon companies, each of twenty-seven wagons; and a Signal Corps detachment that had

both telegraph capability and primitive radios. Finally, Pershing's force included the U.S. Army's only operational airplane unit, the 1st Aero Squadron.[7]

The 1st Aero Squadron

The 1st Aero Squadron was the result of developments that reached back to 1909, when the U.S. Army purchased its first airplane, a Wright Flyer designated Signal Corps No. 1. In early 1910, 1st Lt. Benjamin D. Foulois took the airplane to Fort Sam Houston, outside San Antonio, Texas, where he spent a year learning to fly and conducting experiments under practical conditions. Foulois was still at Fort Sam Houston in March 1911 when the War Department activated a "Maneuver Division" and deployed some 30,000 troops in response to the revolution south of the border. Coincidently, in that same month the U.S. Congress appropriated the first funds for military aviation, $125,000, which the Signal Corps used to purchase five airplanes. Two of these and three new pilots joined Foulois, who organized them into an informal aviation "company."[8] During the next few weeks—and despite its primitive airplanes—the company successfully supported the Maneuver Division, primarily by delivering messages. "If there was any doubt in the minds of individuals of this command as to the utility of the aeroplane for military purpose," Maj. George O. Squier, Chief Signal Officer for the Maneuver Division reported, "that doubt has been removed by aeronautical work done in this division."[9] On May 10, however, Lt. George E. M. Kelly died in a crash, and the post commander ended flying at Fort Sam Houston. Subsequently, the border quieted, and the Maneuver Division dispersed.[10]



Signal Corps No. 1 and crew at Fort Sam Houston, Texas, in May 1910

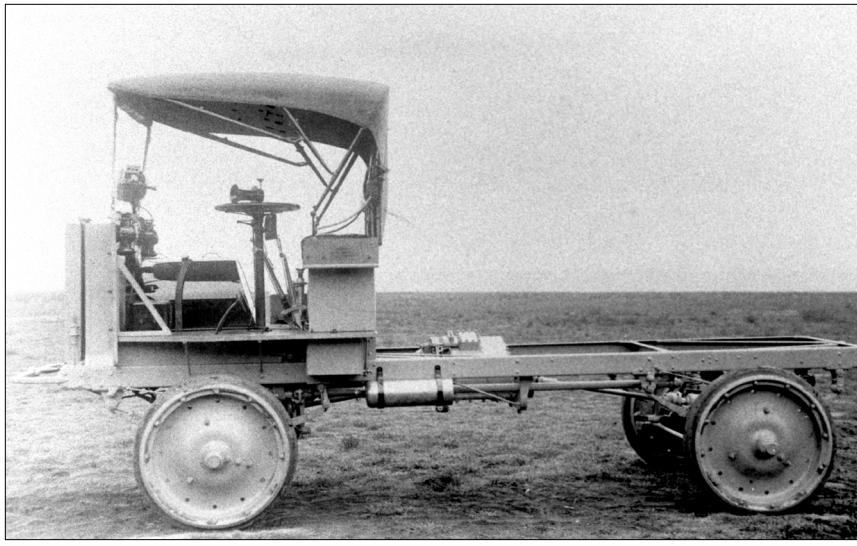
Lt. Benjamin D. Foulois at the controls of a Wright aircraft, equipped with a radio.

Renewed violence early in 1913, however, caused President Wilson to order partial mobilization, and the army formed the "Second Division" at Texas City, Texas. On February 25, the Chief Signal Officer, Brig. Gen. George P. Scriven, ordered the airplanes, personnel, and equipment then at Augusta, Georgia, to Texas City; and on March 5, the army designated the small command as the 1st Aero Squadron (Provisional). The unit consisted of nine airplanes, nine officers, and fifty-one enlisted men organized into two companies, and it spent much of its time practicing cross-country flying and operating from rough terrain, skills that would be of great value in the field. It was soon clear that the Second Division would not become involved in a fight, however, and by June 1913, the squadron had transferred to the new Signal Corps Aviation School at San Diego, California. In December, the 1st Aero Squadron dropped the "provisional" from its title, making it the U.S. Army's first regular air squadron.[11]

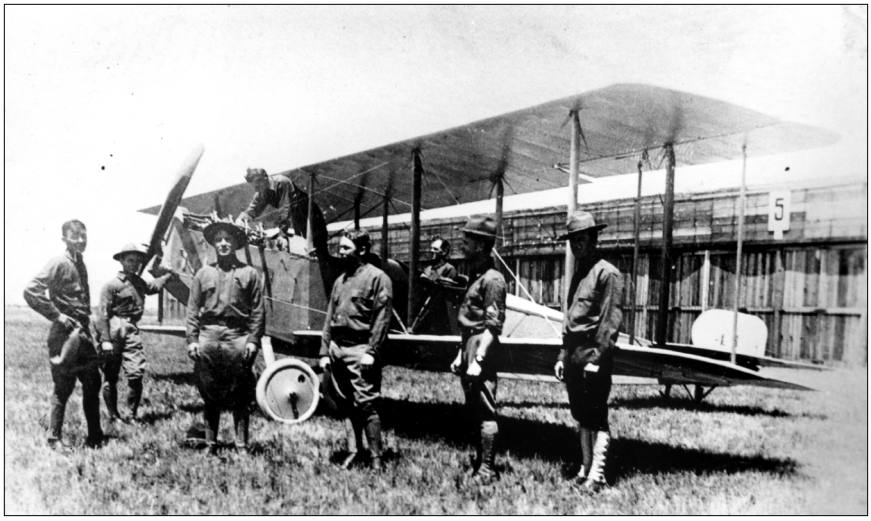
In 1914, recently promoted Captain Foulois took command of the 1st Aero Squadron and began preparing the unit for service in the field. In May, he abandoned the company organization and established a more flexible section organization, which included headquarters, supply, engineer, and transportation sections and eight airplane sections, one for each airplane. Under the new organization, two officers—a pilot and an assistant pilot—were assigned to each airplane. Each pilot took responsibility for care, repair, and maintenance of his airplane and the training and discipline of his crew.[12]

Foulois also moved to standardize the squadron's equipment and to make the unit mobile. Fully equipped, the unit would have eight airplanes, sixteen trucks, six motorcycles, ten sets of airplane tools, and two sets of machine shop tools. Ground transportation was an important concern, and Foulois ordered sixteen ton-and-a-half, four-wheel-drive truck chassis from the Thomas B. Jeffery Company in late 1914. Unfortunately, he was able to obtain only ten Jeffery trucks, and squadron transport remained under strength. The first truck chassis arrived on January 2, 1915, and by May, Foulois and his men had built special truck bodies designed to transport the men, equipment, and supplies needed in the field. Squadron personnel also equipped one of the trucks as a mobile machine shop truck for repairs under field conditions. Foulois also purchased several hangar tents and an automobile for carrying parts and fuel to airplanes forced down in rough country. He was unsuccessful, however, in an attempt to obtain a "radio truck" for communication between the squadron and division headquarters.[13]

Foulois devoted most of his effort to procuring the U.S. Army's first standard airplane. Until 1915, the chronic shortage of funds had forced the Signal Corps to purchase airplanes one or two at a time. The variety of airplanes and lack of standardization complicated mobile operations and caused infinite problems, especially in maintenance and supply. Foulois and the aviators at the Signal Corps Aviation School developed what were, for the time, quite demanding specifications for a standard squadron airplane. These called for a two-seat tractor biplane with a dual control system, a minimum speed of forty miles per hour, and a duration of four hours of flight at top speed. The design had to be streamlined and



The Jeffery "Quad" one and a half ton, four-wheel drive truck, selected as the standard truck for the 1st Aero Squadron. A standard army wagon bed and canvas cover mounted to the chassis completed the vehicle.



The first of the new Curtiss JN–2s at the Signal Corps Aviation School, North Island California. Sgt Vernon L. Burge stands under the propeller. The figure in the cockpit appears to be Capt. Foulois. (Vernon L. Burge Collection, Airman Memorial Museum.)

include frictionless controls, a positive driven fuel pump (as opposed to a gravity-fed system), and a tachometer. Further, the engine had to be easily replaced. Finally, four mechanics had to be able to assemble an airplane in two hours and disassemble and pack it away in one-and-a-half hours. Although twelve companies expressed interest in bidding the contract, only the Curtiss and Martin Aeroplane Companies submitted airplanes for consideration.[14]

Glenn Curtiss had an edge. He had visited England in 1913, where he hired B. Douglas Thomas, who had designed successful airplanes for the Sopwith and Avro companies. Thomas designed the first of Curtiss's J-series airplanes while still in England. This airplane demonstrated desirable characteristics from the beginning, especially a good rate of climb, and the army purchased two as S.C. Nos. 29 and 30. Separately Curtiss also produced a Type N, which the army also accepted. In the competition for a standard airplane, Curtiss submitted a Type J with improvements suggested by the Type N. Ultimately, neither the Curtiss nor Martin airplane proved capable of meeting all of the performance specifications, but Curtiss's modified J was judged the most promising. On January 8, 1915, the army ordered eight, designated by Curtiss as JN–2s. The Aviation Section selected an experienced airman, Lt. Joseph E. Carberry, to be plant inspector for the project.[15]

The Curtiss Aeroplane Company was the largest airplane producer in the United States at the time, and by early 1915 the growing demands of the war in Europe led it to expand into a new facility at Buffalo, New York. When Carberry arrived, he found the factory operating around the clock, seven days a week. In

addition to the eight JN–2s designated for the Signal Corps, thirty-eight others were in various stages of construction. Expansion had come at a price, however. Airplane construction depended upon highly skilled woodworkers and specially selected materials. It was, in fact, more akin to the handmade construction of high-quality yachts than to the assembly line process of automobiles. Many of the new workers lacked the necessary skills, and the materials were of uneven quality.[16] "Privately," Carberry wrote, "some of the wood used is extremely poor compared to that for instance of the Burgess Co., while some of it is as good as any of the samples Mr. [Grover] Loening and I went over at San Diego."[17]

By June 21, the eight JN–2 airplanes, eight sets of spares, and twelve engines had arrived at San Diego. The new airplanes were quaint by today's standards; but compared to the awkward-looking pushers and clumsy early tractors, they were beauties characterized by low rakish lines, staggered equal-span wings, and a long, narrow fuselage.[18] Their appearance, however, hid serious defects. "They *looked* like airplanes," Foulois later wrote. "But we were to find that an airplane that looks like an airplane may be something less."[19]

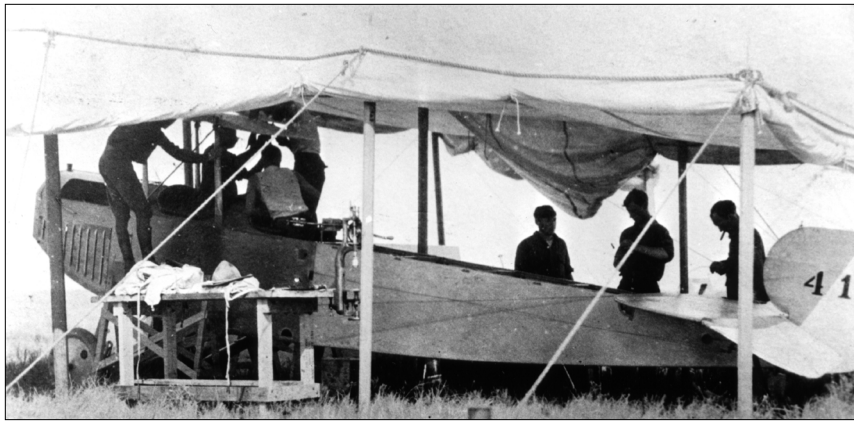
From Fort Sill to Fort Sam

While the 1st Aero Squadron prepared, the Signal Corps began planning a permanent home for the unit on the "Old Target Range" northeast of Fort Sam Houston on land obtained by Lt. Col. Samuel Reber, chief of the Aviation Section, in January 1915.[20] Subsequently, Foulois spent some time in San Antonio, where he prepared drawings and cost estimates for hangars, shops, storehouses, stables, barracks, and quarters for the post and prodded the Quartermaster Corps, which was responsible for construction.[21]

As work on the new post went forward, the Signal Corps ordered the 1st Aero Squadron to Fort Sill, Oklahoma, to conduct observation and fire control experiments with the field artillery. The squadron left San Diego by train on July 26, arriving at Fort Sill on July 29. Squadron personnel found nothing prepared for their arrival, forcing them into the construction business. Foulois secured materials from the post quartermaster, and the men spent the next three weeks building a temporary kitchen, garage, and storehouses and installing a water pipeline. Tents housed squadron personnel, while hangar tents provided some protection for the airplanes.[22]

On August 14, Foulois received orders to send an airplane to the Mexican border at Brownsville, Texas. The section organization now proved its worth. Foulois detached one airplane section under the command of Lt. Joseph Morrow. The airplane, ground transport, equipment, spares, supplies, and men were ready to entrain within two hours. On the following day, a second telegram ordered Foulois to send another airplane to the same location. This section, too, was on its way south in a short time.[23]

The 1st Aero Squadron had made its first flights at Fort Sill on August 10, but accomplished little flying in the next few weeks, as manufacturing problems in the airplanes and engines quickly appeared. The Curtiss OX engines were



Curtiss JN–2, Signal Corps No. 41, in its tent hangar at Ft. Sill, Oklahoma, in 1915. (Vernon L. Burge Collection, Airman Memorial Museum.)

first. Under the procedures Foulois had established for new engines, each was dismantled and thoroughly inspected, then reassembled and run on a test stand. If it performed satisfactorily, the engine was installed in an airplane, flown for ten hours, removed, and overhauled again. If nothing was wrong, then the engine was accepted. These methodical steps now paid off. Quickly the mechanics rejected one engine because the crankshaft, pistons, and connecting rods were out of balance. Foulois sent it back to Curtiss for replacement and at the same time ordered four crankshafts, two cylinders, and a main bearing for other engines. Upon their arrival, however, three of the new crankshafts were found to be unbalanced and had to be rejected.[24] Foulois was determined to make the

A JN–2 taking off at Ft. Sill, Oklahoma. The 1st Aero Squadron's tent encampment is at the left rear. (Vernon L. Burge Collection, Airman Memorial Museum.)

manufacturer perform satisfactorily, even at his own expense. "I don't know where we are going to land in this motor thing with Curtiss before we finish with him," a disgusted Foulois wrote, "but I am going to reject everything that we get from him unless it is right, even if it ties us up tight."[25]

The squadron attempted to observe fire for six-inch howitzers on September 1, but engine problems hampered both airplanes involved, and a frustrated Foulois recommended to the artillery commander that all work with the artillery be suspended until the squadron had received the parts and equipment needed to keep the airplanes operational.[26] By September 6, only two airplanes, S.C. Nos. 41 and 43, were in commission; the other four awaited propellers and propeller bolts. "Have wired and written Curtiss a dozen times about [the propellers on order] but about all we can get out of them are promises," Foulois complained on September 16. "Have come pretty near to the point of breaking off diplomatic relations with that firm."[27] By September 19, Foulois's refusal to accept substandard engines and parts appeared to have had some impact on the engine situation. The most recent engines received were in far better condition than before, although main bearings remained a problem for a time.[28] The other shortages continued, however.

Even worse than these deficiencies, the JN–2s quickly began demonstrating critical defects. The pilots found them unstable, underpowered, and a handful to fly in the heat of the Oklahoma plains. Then, on August 12, S.C. No. 47 crashed, injuring the pilot, Lt. Redondo B. Sutton, and killing the passenger, Capt. G. H. Knox of the Quartermaster Corps. Following Sutton's accident, the pilots convened an informal meeting. Most agreed that the JN–2s were unsafe because of their limited power, poor construction, lack of stability, and overly sensitive rudders.[29] Only two officers, Foulois and Lt. Thomas DeW. Milling—reputed to be one of the best pilots in the army—disagreed. Foulois especially believed that while the machines were pretty poor, they could be used. In his words,

> *The present machines are not satisfactory and I never expected them to be. I did hope, however, that we could stagger along with them for a few months, and in the meantime be trying for something better… . The JN2 machines are structurally safe, but they are underpowered and are not, on account of this fact, for one thing, suitable for service work in rough weather with full load.*[30]

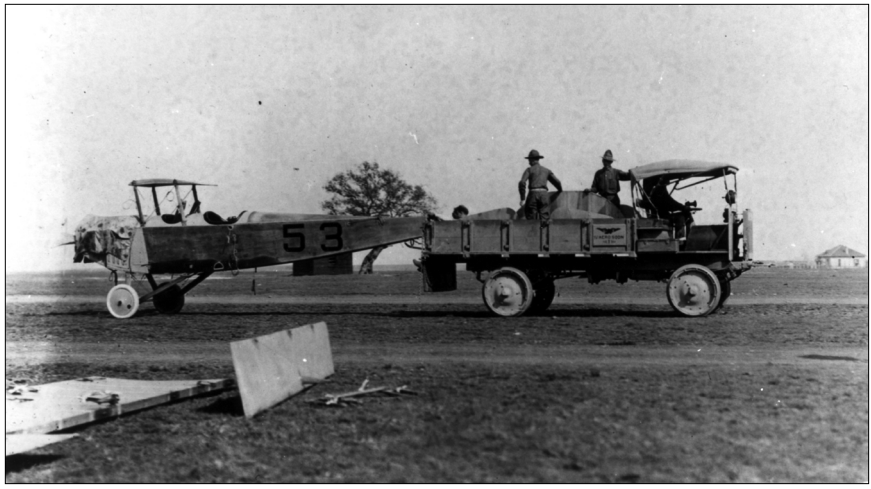
As the result of the meeting, Foulois halted flying at Fort Sill for several weeks while the mechanics examined every nut and bolt on the airplanes. Meanwhile, the War Department initiated scientific tests on the aircraft. On August 23, Dr. Jerome C. Hunsacker, the assistant naval constructor, reported that his tests demonstrated that the JN–2s were underpowered and dangerous. At angles of 12, 14, and 15 ½ degrees, the airplane was "dynamically unstable," while it was unstable laterally in a high-speed spiral. When nearing a stall, the airplane tended to bank too steeply and roll over, and the design caused the lower wing to stall

while the upper wing was at the best lifting angle.[31] Curtiss began redesigning the wings and tail surfaces.

Meanwhile, Morrow's detachment at Brownsville faced similar problems. The unit consisted of four officers, fifteen enlisted men, and S.C. Nos. 44 and 46. Arriving on August 18, Lieutenant Morrow found that the field assigned was too small for the underpowered JN–2s. He asked that S.C. Nos. 30 and 50, a Curtiss J and Martin TT respectively, be sent from San Diego and that the detachment occupy a larger field six miles away temporarily.[32] The response from the nonflying Colonel Reber showed neither sympathy nor an understanding of the problem: "Go into camp at or near post," he ordered peremptorily. "Prepare field which you report rough so that machines can start and land. You are equipped with service machines and none others will be furnished. If you cannot meet the incidents of active service you will be superseded."[33] Morrow obeyed, but the results were predictable: the two JN–2s had great difficulty getting into the air.

On September 5, Morrow crashed, destroying S.C. No. 46 and injuring himself seriously. Lt. Byron Q. Jones, in temporary command following the accident, reported that Morrow had stalled while making a turn. Like Milling, Jones was considered one of the best of the pilots in the army, and he now reiterated the complaints about underpowered airplanes, poor workmanship, and shoddy materials. He was also familiar with events at Fort Sill and added that some of the pilots there were complaining about the airplanes and that it was hard to find artillerymen willing to go up as observers. Jones's report did not follow the chain of command through the Aviation Section, but instead went directly to General Funston commanding on the border, and thence to the War Department, forcing the issue into the open.[34] Both Foulois and Colonel Reber were "decidedly put out" by Jones's report, but Reber was able to answer its complaints because improvements in the JN–2s were already taking place.[35]

In fact, two new JN–3s, S.C. Nos. 52 and 53, had already arrived at Fort Sill on September 3. These featured longer upper wings, modified tail surfaces with stabilizers ahead of the rudder and elevators, and newer engines. The JN–3s looked almost exactly like the latter JN–4 "Jennie" of World War I training and postwar barnstorming fame. Over the next few weeks, Curtiss furnished wing and tail sets, enabling the squadron to modify the remaining JN–2s into JN–3s, except for S.C. No. 45, which retained the JN–2 tail until its end. On October 3, Foulois reported to Cowan that the squadron had completed tests of S.C. No. 42 with the new JN–3 wings, S.C. No. 45 with older J wings, and S.C. No. 48 with JN–2 wings. The tests demonstrated that the JN–3 wings cured some of the JN–2's deficiencies, although they added weight to an already underpowered airplane. The greater wing area should have increased lift; but the increased weight appears to have largely offset any gain.[36] Foulois wrote that "Our two previous accidents with this type of machine [JN–2], were, in my opinion, caused through overloading a machine that was already too heavy in the first place."[37] Fundamentally, the alterations failed to address this problem successfully.

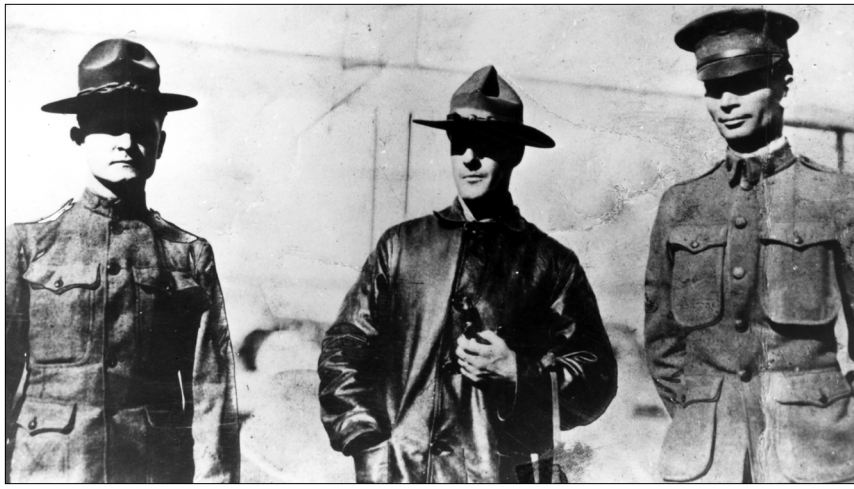


Towing the fuselage of Curtiss JN–3, Signal Corps No. 53, by truck at the San Antonio Aviation Center, early 1916. (Fort Sam Houston Museum, San Antonio, Texas.)

In October, the 1st Aero Squadron began preparations to move to the new aviation post in San Antonio. Months earlier, Foulois had decided to fly the airplanes cross-country and truck the men and equipment from Fort Sill to the new post, some 440 miles to the south, instead of making the move by train. This effort would be a major test of his equipment, especially his motor trucks, and, if successful, a vivid demonstration of the 1st Aero Squadron's mobility. Foulois prepared the squadron carefully for this trip, but despite his best efforts, he was unable to acquire all of the transport necessary. Thus, a portion of the squadron's ground support and personnel had to go by rail.[38]

On November 17, an advanced ground echelon of cars and motorcycles under Master Signal Electrician (MSE) Stephen J. Idzorek left Fort Sill to scout the roads and potential landing fields. The squadron followed on the 19th, the JN–3s taking off at one-minute intervals while the transport column of trucks, leased trailers, and motorcycles under MSE Herbert Marcus followed. Sgt. Vernon L. Burge took charge of the contingent that traveled by train. The squadron reached Fort Sam Houston on November 26 after an uneventful flight broken by stops at Wichita Falls, Fort Worth, Waco, and Austin. The exercise was a major success, marred only by the only loss of a Jeffery truck that caught fire near Fort Worth. The detachment from Brownsville rejoined the squadron on December 29.[39]

In the meantime, however, Foulois and his men discovered that little real work had been accomplished on the aviation center. "Work should have been done before we arrived but like everything else in connection with the new post, somebody had forgotten to attend to it," according to Foulois.[40] "To say that I was disappointed in the progress at the new post, is putting it mildly," he wrote Colonel Reber shortly after his arrival. "I am not only disappointed, but thor-



Capt. Benjamin D. Foulois (center) and two stalwart senior enlisted men of the 1st Aero Squadron, Sgt Vernon L. Burge (left) and Master Signal Electrician Stephen J. Idzorak (right).

oughly disgusted with the way the contracts have been handled."[41] Many facilities had yet to be built, the roads and walks were incomplete, and the landing field was unprepared. Worse, what work that had been accomplished ignored the "Estimate of Costs" that Foulois had prepared on March. The two steel hangars and the machine shops were too small, the two-story officer quarters disturbed the flying air, and the temporary garages were too short. The 1st Aero Squadron returned to the construction business. The men temporarily occupied the two hangars and some tents on Fort Sam Houston and began work on the facilities and field. The Quartermaster Corps put in latrines, and Foulois secured oil lamps for use until electricity reached the new post. The airplanes remained at Fort Sam Houston temporarily until early January 1916.[42]

The time and effort 1st Aero Squadron personnel spent on construction should have been devoted to their airplanes. In addition to continuing shortages in parts and equipment, the squadron had been operating under field conditions, exposed to the heat, cold, and high winds of Oklahoma, since July 1915. The airplanes required complete overhauls and new fabric covering. Replacement cloth arrived in early February and the work took a month.[43] Even repaired and restored, the airplanes remained inadequate, as Foulois well knew. On March 10, he complained that they were unsuitable for "co-operation with the field artillery or any other branch of the service." Under certain weather conditions, they were unable to carry a pilot, observer, and fuel to military altitudes. Most had yet to receive their new engines, and for those that had, the mechanics were unable to get them to operate consistently even under garrison conditions.[44] All things considered, the 1st Aero Squadron was in sad shape for active service in the field, where events were soon to land it.

The Punitive Expedition Assembles

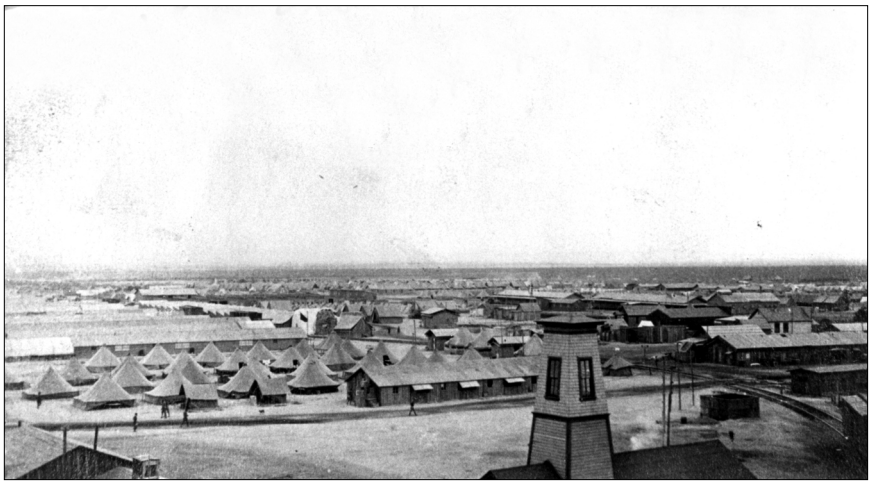
Following Pancho Villa's attack on Columbus and the decision to pursue the bandits, messages flew between Washington, D.C., the Southern Department headquarters at Fort Sam Houston, and subordinate headquarters in Texas and New Mexico as the War Department assembled its forces. As already noted, General Funston determined the composition of the Punitive Expedition, but it is also clear that inclusion of the 1st Aero Squadron had interest at the highest level. On March 10, Secretary of War Baker wrote General Scott that the orders for General Funston were to include the use of airplanes for observation where possible, and the President wanted those orders followed strictly. Word immediately went to the Signal Corps. On the same day, General Scriven asked Colonel Reber what needed to be done to prepare Foulois's force for service in Mexico. Reber gave a fairly accurate report on the status of the 1st Aero Squadron and added, perhaps a bit optimistically, that the unit could be shipped to Columbus almost immediately, although two of its officers were on detached service. Reinforcements, however, were almost nonexistent. The Signal Corps Aviation School had only three rated officers and only five of the twenty-three aviation students then in training had enough experience to join Foulois. As for airplanes, those at the school were totally incapable of work in the field.[45]

At San Antonio, in the meantime, Foulois and his men began scrambling to prepare for field service as soon as word of Villa's raid reached them. The greatest weakness of the squadron lay in its lack of aircraft. Aviation officers who had been watching developments in Europe understood that a squadron needed a minimum of twelve operational airplanes, twelve replacements, and a reserve of twelve—a total of thirty-six airplanes—to sustain operations. The 1st Aero Squadron, of course, had just eight airplanes. Initially, Funston ordered it to send six airplanes with Pershing and to leave two in reserve at San Antonio. Foulois, however, argued for all eight. Experience at Fort Sill had taught him to expect half his airplanes to be unserviceable in the field at any one time, thus he needed them all. Funston acquiesced. There would be neither replacements nor a reserve for the 1st Aero Squadron![46]

The squadron also remained desperately short of parts and transport. On March 10, Foulois sent the Chief Signal Officer long lists of parts, supplies, and equipment needed immediately, including a request for nine new Jeffery trucks. General Scriven had some $19,000 immediately available for the emergency and spent a good deal of it on the squadron, including buying such odd items as wrist watches for the pilots. He also stripped the Aviation School of its backup stock where possible. On March 12, for example, Scriven instructed Cowan to send as many Bosch spark plugs as possible to San Antonio, and two days later, he followed with an order to forward eight Bosch magnetos by express. The trucks Foulois requested, however, proved unavailable, and Scriven directed Foulois to have the quartermaster at San Antonio lease some from civilian firms. Eventually, Foulois left San Antonio with seven Jeffery trucks and three others rented locally.[47]

As already noted, the mission of the 1st Aero Squadron remained communications and observation; thus, weapons were not needed. The airplanes lacked the fittings to mount arms of any sort anyway, and, as described above, were already overburdened just carrying a pilot, observer, personal equipment, and a full load of gasoline. The weight of even an air-cooled Lewis machine gun would have reduced performance to an unacceptable level. Ultimately, several of the pilots carried pistols, and two equipped themselves with high-powered .22 caliber rifles, but these were for personal defense and, perhaps, an occasional meal rather than fighting.[48]

On March 12, the 1st Aero Squadron flew to Fort Sam Houston, where the airplanes were dismantled, crated, and, along with the squadron transport, equipment, parts, and supplies, loaded aboard railroad cars. At noon on the next day, the train steamed out of San Antonio. In addition to Foulois, the pilots included Capt. Townsend F. Dodd and Lts. Joseph E. Carberry, Thomas S. Bowen, Carleton G. Chapman, Herbert A. Dargue, Edgar S. Gorrell, Walter G. Kilner, Ira A. Rader, and Robert H. Willis. Foulois took no chances; he posted ten men with rifles on a flat car at the front of the train, added another ten with pistols to the sleeping cars, and equipped the sleeping cars with sixteen rifles as well. But Foulois appears to have had more to fear from Americans than from Mexicans. An infantry company and several boxcars of ammunition also joined the train, and to prevent it from becoming too long, railroad officials tried to shunt the cars carrying airplanes off to a siding for later shipment. Foulois had to use his orders showing his unit's priority status to prevent the airplanes from being left behind. The little command picked up ten days's rations and two additional leased trucks at El Paso on March 14 and pulled into Columbus the next morning.[49]



Bird's eye view of the military camp at Columbus, New Mexico, in 1916. (Vernon L. Burge Collection, Airman Memorial Museum.)

Arrival of a train at Columbus, New Mexico, 1916.

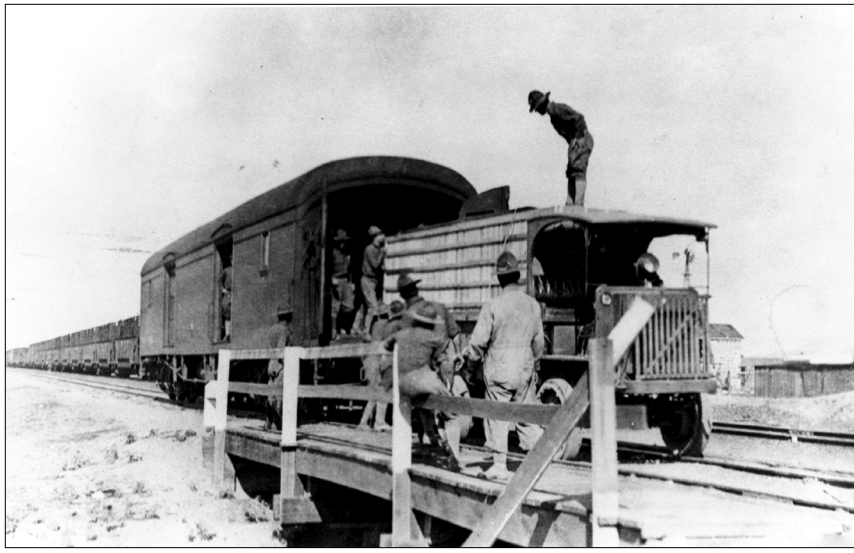
Foulois and his men found that the Punitive Expedition was already on the move south in two columns. The eastern column, designated the First Provisional Cavalry Brigade, consisted of the 13th and 11th Cavalry Regiments, Battery C of the 6th Field Artillery, and a company of engineers. Under Col. James Lockett, this column departed Columbus early on March 15, crossed the border after noon, and passed through Las Palomas. A reinforced brigade composed primarily of the 6th and 16th Infantry and various support units followed Lockett. The second column, designated the Second Provisional Cavalry Brigade, consisted of the 7th and 10th Cavalry Regiments and Battery B of the 6th Field Artillery. Commanded by Col. George A. Dodd, it marched from Culberson's Ranch, west of Columbus, toward Casas Grandes. Unencumbered by wagons, this column marched ninety-three miles in two days, reaching Colonia Dublán, a small Mormon community just outside Casas Grandes, by the evening of March 17. Without waiting, Pershing ordered the 7th Cavalry under Col. James B. Erwin to push south to San Miguel de Babícora early on March 18 and despatched the 10th Cavalry by railroad to Madera, southwest of Babícora. The column from Columbus, slowed by its wagon companies, reached Casas Grandes on the afternoon of March 20.[50]

As Pershing moved south, Foulois and his men prepared to join the fast-marching columns. They quickly established a camp and hauled the airplanes to a field east of town for assembly. Herbert Dargue made the first sortie early that evening, a short test flight in S.C. No. 43. The squadron finished assembling the airplanes on the following day and at the same time replaced the old "J" style wings on S.C. No. 45 with JN–3 wings. All but two of the squadron's airplanes

Brig. Gen. John J. "Black Jack" Pershing, commander of the Punitive Expedition, at Colonia Dublán, Mexico, July 15, 1916.

were test flown on March 16, and a sortie by Townsend Dodd with Foulois as his observer took them about twenty miles inside Mexico.[51] According to Foulois, they failed to spot any hostile forces, an important report since it showed Pershing "that there were no Mexican rebels within a day's march of the head or flanks of his infantry and cavalry columns."[52]

Ironically, the 1st Aero Squadron's real work in those first days at Columbus had little to do with flying. Mountains, deserts, and scarcity of roads made northern Mexico a logistician's nightmare. For support in this type of terrain, the U.S. Army normally depended upon a system of railroads, wagons, and pack mules. Now that changed. Denied access to the Mexican railroads by the Carranza government—with one or two unofficial exceptions—and concerned about the availability of animal feed and forage, Pershing determined to rely upon the unproven motor truck for much of his logistic support. But the U.S. Army had almost no experience with motorized transport. The 1st Aero Squadron, with its

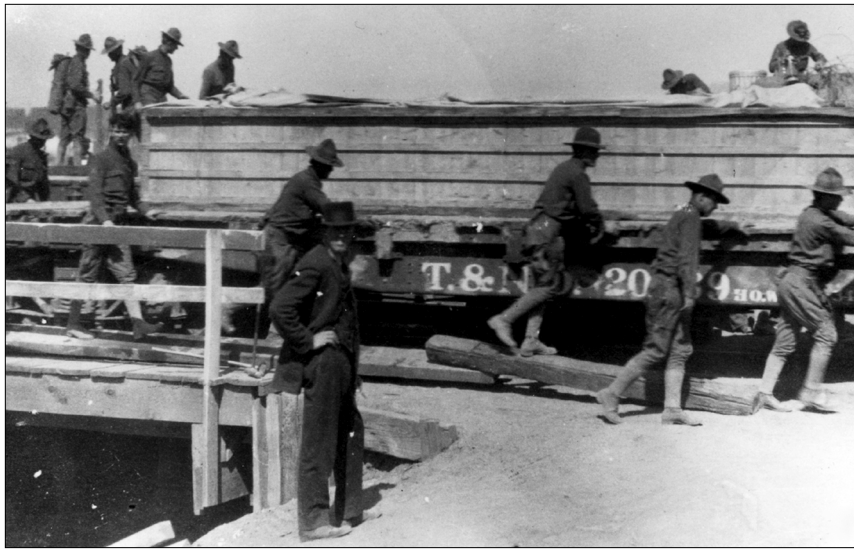


1st Aero Squadron personnel transferring a crated airplane from a rail car to motor truck at Columbus, New Mexico.

own organic motor transport, filled this void temporarily. The day the squadron arrived, it was needed to carry men and supplies into Mexico.[53] Foulois selected Lt. Edgar S. Gorrell to deliver the cargo on the night of March 15-16. Gorrell later wrote that

> *I was in charge of a truck train consisting of two four-wheel-drive trucks which we drove with lights extinguished from Columbus to just across the border, a small place called Las Palomas, Mexico, where the troops halted for the first night. The two trucks were loaded, one with bread and one with officers who had arrived too late to march with the infantry. What an experience it was, driving this original truck train into unfriendly territory, with a guard consisting of airplane mechanics on both trucks, rifles ready all the time, and not a man in the guard knowing how to use his rifle! All men of the guard were airplane mechanics, none of whom had been taught how to shoot.*[54]

The 1st Aero Squadron's contributions to Pershing's logistics and nascent motor transport continued. On March 16, three trucks helped the Quartermaster Corps haul supplies into Mexico, and later that day four more transported troops. On the following day, nine trucks hauled supplies into Mexico, one carrying Pershing's personal baggage. On March 18, a squadron truck delivered twenty miles of field wire to Boca Grande, Mexico, some forty miles south of Columbus, while four others carried commissary supplies and forage to La Ascención, sixty miles south. These remained three days, relaying supplies from



1st Aero Squadron personnel unloading extra wings at Columbus, New Mexico.

Boca Grande to La Ascención. Another truck carried a load of field wire for the Signal Corps to El Espia. And for good measure, Foulois's mobile machine shop section spent a day repairing a Telefunken radio belonging to the Signal Corps.[55]

By March 18, Foulois had concluded that the Quartermaster Corps was unable to efficiently manage the trucks arriving at Columbus and offered his services. Pershing's chief of staff placed him temporarily in charge of all transport for the next two days. At noon on the March 18, the first twenty-seven Jeffery chassis and an equal number of wagon bodies arrived in Columbus without any of the equipment and fastenings necessary to assemble them. The 1st Aero Squadron stepped into the gap again. Foulois put his engineering section and machine shop to work manufacturing parts, drilling holes, and assembling the bodies. The mechanics worked all night and into the next day preparing the trucks, and when the squadron departed for Mexico late on March 19, Foulois left his Engineer Section, the machine shop, and about half his enlisted men at Columbus completing work on the Quartermaster Corps trucks. By March 22, Pershing had two complete truck trains, each of twenty-seven trucks, in operation between Columbus and his advanced base, greatly simplifying his supply situation. The 1st Aero Squadron detachment had assembled these in four days and nights of hard work. Subsequently, the army operated over three hundred trucks along the border and in direct support of the Punitive Expedition. The force Pershing had led into Mexico in March was largely animal-powered; the one that emerged less than a year later was predominantly gasoline-driven. The 1st Aero Squadron thus played an indispensable role in establishing Pershing's logistic support and a major role in the mechanization of the U.S. Army.[56]

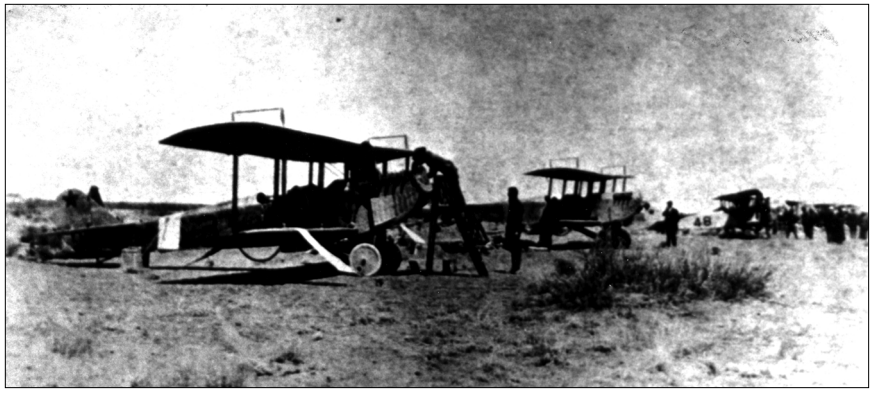
Flying into Mexico

On Sunday, March 19, at about 1:30 p. m., Foulois received the word he and his men had been eagerly awaiting. Orders from Pershing directed the squadron to report without delay to his headquarters at Casas Grandes. The squadron responded immediately. Except for Dodd's airplane with Foulois as the observer, each airplane had a single occupant and carried enough oil and gas for a four-hour flight. Most carried a variety of equipment, including field glasses, extra goggles, a mess kit, emergency rations, a sleeping bag, army blankets, an emergency tool kit, an extra battery, engine and propeller covers, tie-down bands, and personal arms and ammunition. Shortly after 5:00 p.m. Dodd and Foulois took off in S.C. No. 44, followed one after the other by Kilner in S.C. No. 42, Dargue in S.C. No. 43, Bowen in S.C. No. 48, Chapman in S.C. No. 53, Carberry in S.C. No. 45, Gorrell in S.C. No. 52, and Willis in S.C. No. 41. The squadron truck train carrying most of the enlisted crews, parts, field equipment, and supplies started south just after the airplanes departed. The takeoffs were stomach churning. Weighed down with personal gear and thirty-four gallons of gas, Gorrell's airplane just cleared a wire fence at the end of the field. He then held his breath when Kilner barely skimmed over. Kilner immediately suffered engine trouble, circled, and returned to the field. The other seven airplanes successfully followed each other into the deepening dusk.[57]

And darkness proved a formidable challenge. Cases Grandes was over a hundred miles south of Columbus. The 1st Aero Squadron could not reach that destination until long after the sun had set; and the unit was completely unprepared for night flying. Dodd was the only pilot who had actually flown after dark, the pilots lacked adequate maps and had only a vague notion of the location of Casas Grandes, and the compasses carried by the JN–3s were characterized chiefly by their unreliability. The only navigational instructions Foulois gave prior to take off was for each airplane to follow the one in front of it, and Pershing's headquarters promised to light a bonfire to identify the landing field at Casas Grandes. Otherwise, each pilot had to rely on his own skill and confidence. Despite the hazards and uncertainty, however, the men were keen. They had been told their airplanes were needed, and they would do their best.[58]

As darkness closed in, the JN–3s separated. The first four airplanes, led by Dodd and Foulois, managed to stay together, but the pitch dark forced them to land at La Ascención, about halfway to Casas Grandes. As the airplanes touched down, a ten-foot-high cloud of dust raised by a column of cavalry blinded the pilots, who nonetheless managed to land safely. The other three airplanes missed the landing and continued south into the night. As soon as Foulois could place a guard around his four airplanes, he had the nearby contingent of the 11th Cavalry send patrols to look for the missing airplanes.[59]

The next morning Foulois's four airplanes took off from La Ascención shortly after 8:00 a.m. and followed the Casas Grandes River south, scouting for the other airplanes along the river without success. They reached Casas Grandes at 9:35 a.m. Unable to locate U.S. troops or a field near the town, however, the



The 1st Aero Squadron in the field. This photograph has to have been taken either at Columbus prior to the flight into Mexico on March 19, 1916, or just after the arrival near Casas Grandes on the morning of March 20, since Lt. Bowen crashed in S.C. No. 48, the third aircraft in line, late on the morning of March 20.

four airplanes landed about ten miles to the northwest. There Foulois learned that Pershing's headquarters was actually at the Mormon colony of Colonia Dublán about fifteen miles away, and that Dargue in No. 43 had landed near there earlier in the morning. Dargue subsequently reported that his airplane had failed to climb as fast as the other airplanes and he quickly lost sight of the others. He finally landed about twenty miles south of La Ascención without incident, spent the night, and resumed his flight the next morning.[60]

Foulois led his contingent to nearby Colonia Dublán. As Bowen approached the landing area, however, a small whirlwind, or dust devil, caught S.C. No. 48, which stalled and crashed from a height of about fifty feet. Bowen emerged from the wreckage with bruises and a broken nose. At Colonia Dublán, along with Dargue, Foulois also found Kilner in S.C. No. 42, the airplane forced to return to Columbus because of engine trouble. Overnight, the mechanics had replaced the balky OX engine with a new OXX engine. Kilner had taken off at daybreak and made an uneventful flight to Colonia Dublán, arriving a few minutes before Foulois's contingent. Foulois also discovered that his situation might have been worse had the squadron managed to find the field the previous night. The landing site selected by ground officers was surrounded by cottonwood trees on three sides and covered with stumps and high clumps of grass. The beacon fires were lit under the trees, and if the airplanes had tried to land in the dark, the whole command would have probably wrecked.[61]

All in all, one has to consider Foulois's decision to lead the 1st Aero Squadron south late on the afternoon of March 19 to be exceedingly poor judgment. Foulois was a "can do" officer and when ordered to join the expedition immediately, he followed Pershing's order to the letter, always a good policy where "Black Jack" was concerned. But in doing so he ignored his usual com-

The 1st Aero Squadron refueling at Casas Grandes, Mexico. To the left, a portion of the squadron truck train; to the right Signal Corps Nos. 43 and 45. (Otis A. Aultman Collection, El Paso Public Library, El Paso, Texas.)

mon sense and the knowledge that the 1st Aero Squadron was totally unprepared for night flying. Army practice would have allowed him, as Pershing's aviation expert, to report to his superior on the squadron's limitations and that it would depart Columbus at first light the next morning. Had he done so, the 1st Aero Squadron would, in all probability, have had an uneventful flight like that Kilner experienced on March 20. The pilots would have had an easier time staying together, and, more than likely, at least seven of the airplanes would have reached Colonia Dublán in one piece. As things worked out, however, Pershing now had only five operational airplanes available for immediate duty. For the time being, the fate of S.C. Nos. 41 and 53 and their pilots remained a mystery.[62]

Operations in the Field

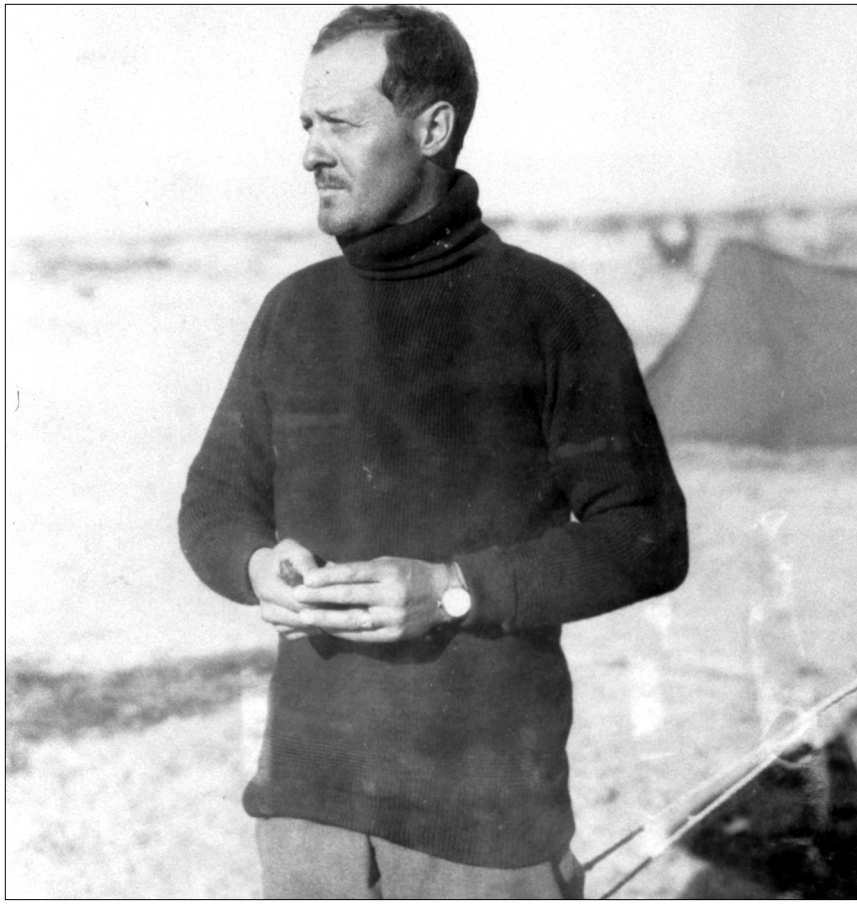
Missing and wrecked airplanes aside, work had to be done. Foulois reported to Pershing, who ordered a reconnaissance along the Mexican Northwestern railroad south toward Cumbre Pass in the Sierra Madre mountains. Dodd and Foulois flew this mission, taking off at noon. They had proceeded only about twenty-five miles, however, when they ran into trouble. The Sierra Madres rose above 10,000 feet and featured jagged peaks and rugged canyons that intensified the wind, created severe up and down drafts, and channeled it in unexpected directions. The underpowered JN–3s were already operating at close to their maximum altitude and could barely exceed their stalling speed, especially with an observer aboard. Despite every effort, Dodd failed to get S.C. No. 44 to climb over the foothills of the Sierra Madres, as violent whirlwinds and terrific updrafts battered the airplane and its occupants. The airplane shook madly and

Prepared for an attack, a 1st Aero Squadron enlisted man takes his defensive position under a "REO" truck manufactured by the R.E. Oldsmobile Company. Note the chain drive, which was quite common to trucks well into the 1920s. (Vernon L. Burge Collection, Airmen Memorial Museum.)

bucketed up and down frantically in the turbulent air. Dodd had to keep the nose down to maintain sufficient speed to prevent a stall, and the constant loss of altitude prevented any attempt to cross the foothills. After an hour, the weary pair of aviators returned to base where Foulois reported failure.[63]

It was a poor beginning to the 1st Aero Squadron's adventures in Mexico—and a portent of things to come. Pershing sent a message to Funston reporting the day's events and the loss of aircraft. The Punitive Expedition, Pershing reported, needed more robust airplanes with more powerful engines. Funston's comment on the situation reflected the ignorance of a ground officer located far from the field of operations. "I am unable to understand," he wrote, "[the] difficulties of flying of aeroplanes in view of fact that these machines were flying daily here [at San Antonio] at great altitudes."[64] Funston failed to realize that Foulois's base at Casas Grandes was a full mile above sea level, that the passes connecting the Casas Grandes and Galeana Valleys ranged between 6,000 and 7,000 feet, and that Cumbre Pass lay at about 9,000 feet. All of these altitudes were higher than most of the army pilots had ever flown. And as a nonflyer, Funston undoubtedly had little knowledge of the effect of thinner air on lift. The altitude in that part of Mexico, compounded by the radical temperature extremes and unpredictable winds, presented a serious obstacle to Foulois's little band of aviators.[65]

The next day, March 21, however, proved much more successful. Ordered to locate a column of the 7th Cavalry under Colonel Erwin in the Galeana Valley, Dodd and Foulois took off in S.C. No. 44 about 8:30 a.m. They found Erwin's camp on the Rio Santa Ana, landed, and delivered messages. Erwin, they dis-



Capt Benjamin D. Foulois in Mexico.

covered, was out of rations and forage, and his pack radio had failed. The two men returned to Casas Grandes, despite exceptionally strong winds and formidable updrafts, and Foulois despatched seven of the squadron trucks loaded with cargo back to Erwin's column. The trucks reached the 7th Cavalry with the much needed supplies that night. Later that day, Foulois also had Col. George A. Dodd, the rangy, hard-driving old Indian fighter who commanded the 2d Cavalry Brigade, driven to Erwin's camp in the squadron automobile. [66]

That afternoon, Foulois also received a pleasant surprise. Lieutenant Willis, one of the two missing pilots, turned up. When Willis lost sight of the other airplanes during the flight from Columbus, he had continued south past Casas Grandes until darkness and shortage of fuel forced him down about five miles from Pearson, Mexico. S.C. No. 41 was badly damaged during the landing, but Willis escaped unhurt. He then hiked north along the Mexican Northwestern Railroad, walking at night and hiding during the day, until he met U.S. troops.[67]

The 1st Aero Squadron in Mexico; probably following a mission by Signal Corps No. 43. The pilot at center appears to be removing his helmet.

Willis's return meant that only Gorrell and S.C. No. 52 remained unaccounted for, and the next morning, March 22, Foulois sent Dargue in S.C. No. 43 to reconnoiter the area around Pearson, where Willis had crash landed, believing that Gorrell had come down in the same area. Dargue was unsuccessful. In the meantime, Willis and his airplane crew took a truck to Pearson to strip the wreck of S.C. No. 41 of useful parts. Unidentified individuals fired on this detachment before it reached the crash site, however. No one was hurt, and the mechanics returned fire, but Willis decided that it was unsafe to proceed without a larger detachment. In the meantime, during Willis's absence, Foulois received the happy news that his missing aviator, Lieutenant Gorrell, was with a detachment of troops at Ojo Fedorica, south of La Ascención, and was on his way to camp.[68]

Concern over downed airplanes and missing pilots could not take precedence over the squadron's mission, however, and the 1st Aero Squadron achieved some success on March 22, as it had on the previous day. Directed to locate and communicate with Colonel Dodd's cavalry in the Galeana Valley and also with columns moving along the Northwest Railroad, Lieutenants Kilner and Rader in S.C. No. 42 and Carberry in S.C. No. 45 flew to El Valle, where they found Dodd's field force, landed, and returned to Colonia Dublán with reports from Dodd, accomplishing a 120-mile round trip in the process.[69]

The effort to communicate with troops moving south on the Northwest Railroad was unsuccessful. Pershing's chief of staff told Foulois that the messages for these units were not important enough to justify extraordinary risk. Foulois thus ordered his pilots to fly only as far into the mountains as they could safely and not press too hard. All things considered, Dodd and Christie in S.C. No. 44 and Chapman in S.C. No. 53 did extraordinarily well. They left Colonia Dublán at 7:00 a.m. and flew deep into the Sierra Madre mountains, reaching the northern end of the Cumbre Pass tunnel, but could go no farther. For two hours,

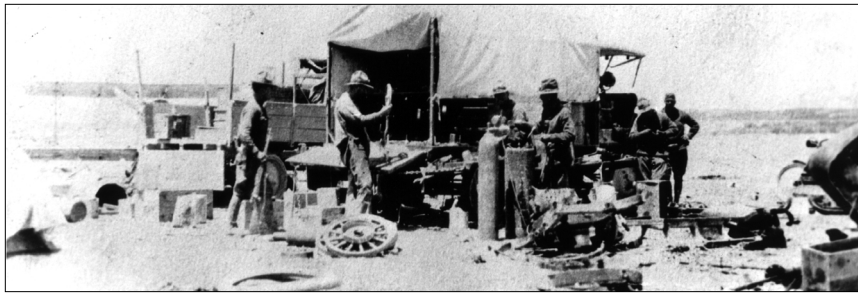
At Satévo, Mexico, the 1st Aero Squadron personnel parked their trucks in a hollow square for defensive purposes, April 1916. (Vernon L Burge Collection, Airman Memorial Museum.)

they fought high, swirling winds and violent updrafts that prevented more progress and often drove them down to within twenty feet of the treetops. Despite the hazardous conditions, the two airplanes located a detachment of troops near the tunnel, but the winds and terrain made a safe landing impossible. Unsuccessful, they returned to Colonia Dublán.[70]

As a result of the squadron's experience, Foulois sent a memorandum on March 22 affirming once again that the existing equipment was inadequate and asking Pershing to place an order by telegraph for the immediate delivery of ten of the latest, most powerful airplanes available. Specifically, he wanted two Martin S airplanes powered by 125 hp Hall-Scott engines, two Curtiss R–2s with 160 hp engines, two Sturtevant airplanes with 140 hp engines, two Thomas airplanes with 135 hp engines, and two Sloane airplanes with 125 hp engines. Reflecting the terrible conditions in Mexico and the beating his airplanes were taking, Foulois also requested extra allotments of spare engines, propellers, lower wing sets, landing gear, tail control surfaces, radiators, and magnetos with the airplanes.[71] In justification of his request, Foulois explained that

> *The present service in northern Mexico, where all operations of aeroplanes must commence at not less than 5,000 feet altitude on the ground, and operate above mountain tops 10,000 feet above sea level, makes it imperative that all aeroplanes sent out for this service be equipped with very powerful engines, and that these aeroplanes must be capable of climbing to a height of at least 18,000 feet with a pilot, observer, and four hours's fuel. . . . All of the several types of aeroplanes asked for in this memorandum herewith lay claim to high climbing and weight carrying ability*.[72]

Problems with the weather, altitude, and flying conditions continued. In an effort to communicate with Colonel Dodd's column again on March 23, Foulois sent three airplanes, Carberry in S.C. No. 45, Chapman in No. 53, and Christie in No. 44. These took off at 8:00 a.m. Two hours later, however, a huge sand and



The machine shop truck at Satévo in April 1916. The mechanics appear to be working on car or truck tires. (Vernon L. Burge Collection, Airman Memorial Museum.)

snow storm with winds up to 40 m.p.h. blanketed the area, halting air operations.[73] This storm was followed late on March 24 by a drop in temperature and a blizzard that lasted several hours. "The dust in the air," according to Foulois, "was so thick that the snow was actually brown by the time it hit the ground."[74] Grounded miles from Casas Grandes, the three airplanes were unable to return for two days.[75]

Ground activities could continue, however, and on the 23d Foulois sent Willis with two trucks and a strong escort to retrieve usable parts from the remains of S.C. No. 41. The detachment reached the crash site without incident, where Willis found that the Mexicans had scavenged the wreck and "stolen everything that could be removed, and cut and broken practically everything that had not been damaged in his landing of March 19th." The party returned with only the engine and a few serviceable parts. Foulois also took the opportunity to send Bowen to Columbus by automobile for medical treatment. Bowen rode with Capt. Charles DeF. Chandler, one of the U.S. Army's earliest and most experienced pioneer aviators, who, by coincidence, was serving as Chief Signal Corps Officer with the Punitive Expedition.[76]

At noon on the 23d, a bedraggled Gorrell finally reached camp. The lieutenant's report was a saga. After he had lost sight of Willis on March 19, Gorrell continued south, well past Casas Grandes, until in the pitch black he saw what he took to be the bonfire that was supposed to designate the landing field. As he got closer, however, it dawned on him that the light was a forest fire. Unknown to Gorrell, Willis was nearby, had made the same error, and the two almost collided as they approached the fire. They separated again, and Gorrell decided that he had flown too far south. He followed the North Star back through the mountains, again missing Casas Grandes, until his engine quit. The successful landing was an unexpected surprise. "I had landed a plane at night for the first time, with a dead stick, out of gas, out of oil, making what was practically a stalled landing," he later wrote. "The plane seemed to run less than twenty feet."[77] Gorrell had flown more than 220 miles during his perambulations. He alighted about a hundred yards from a stream with mountains all around and a few adobe huts

nearby. The lieutenant took his pistol, canteen, rations, and primitive map and followed the North Star, walking well into the morning. Out of water and suffering from heat, however, he returned to the landing site. Despite passing out several times, he made it back to the stream. Then, an unarmed Mexican man approached on horseback, and the revived Gorrell offered him $8 if he would lead him to U.S. troops. The guide led him to La Ascención about thirty miles away. The next morning, March 22, Gorrell and some troops returned to the airplane, which was still untouched. He filled the radiator from the stream, added gas and oil, then took off in a strong head wind and heavy rain. He managed to reach Ojo Federico along Pershing's line of communications, where he landed on a short, narrow strip of land next to a lake. Shortly afterward, a convoy of trucks happened by and provided him with a drum of gasoline and some oil. Gorrell tried to take off in the heavy rain, but a crosswind caused the airplane to drift off course and hit the only obstacle in the area, the now empty gasoline drum, which gouged a huge piece out of the rear spar of the left lower wing. Gorrell took off anyway, but suddenly noticed that the tacks attaching the fabric to the wing had begun to pull out. There was nothing left to do but turn around and land. Subsequently, another of the ubiquitous truck trains happened by, and Gorrell hitched a ride to Colonia Dublán.[78]

Flying resumed with the return of clear skies on March 25. Addressing the problem of underpowered airplanes, Foulois sent Dargue in No. 43 to Columbus with despatches and to have a new OXX engine installed. Meanwhile, just before noon, Carberry and Chapman returned from Galeana Valley near El Valle, where they had been grounded. Christie's S.C. No. 44 remained behind, however. High winds had torn S.C. No. 44 loose from several soldiers trying to tie the airplane down and damaged the air frame. Foulois, himself, spent a frustrating day. He left Colonia Dublán about 1:00 p.m. by automobile carrying dispatches to Pershing, who had gone to El Valle. He reached El Valle about 4:30 p.m. only to find that Pershing had returned to Colonia Dublán by another route. When Foulois got back, he found that Christie had abandoned his airplane and driven back with Pershing.[79]

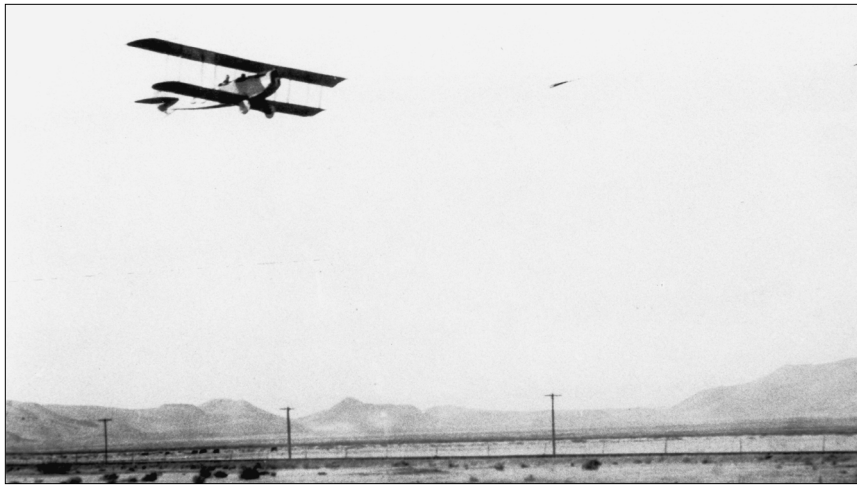
The other departure that day was Lieutenant Gorrell, who took a crew of mechanics and two trucks to Ojo Federico to repair S.C. No. 52, which they found undisturbed. Lacking a spare lower wing panel, the mechanics lashed an extra wing strut between the remaining sections of the rear spar, applied a linen patch over the hole, and Gorrell flew the airplane to Colonia Dublán. On the following day, March 26, Kilner flew Dodd in S.C. No. 42 to Galera Lopena with a tail skid to replace that on Christie's damaged S.C. No. 44. Kilner then flew back to Colonia Dublán, while Dodd flew No. 44 to El Valle. The retrieval of the damaged Nos. 44 and 53 gave the squadron a strength of six airplanes. Foulois spent much of the 26th completing a plan for the most effective employment of his limited strength.[80]

In the meantime, the Punitive Expedition moved toward its first major clash with Pancho Villa's band. Villa and about four hundred men had reached Rubio on March 24, where he learned of a Carrancista garrison at Guerrero. On

At field headquarters near Casas Grandes, Mexico, April 1916, dashing airmen Lts. Herbert A. Dargue (left), and Edgar S. Gorrell (right) pose with Signal Corps No. 43.

Sunday, March 25, as Foulois reassembled his squadron at Colonia Dublán, Villa's band broke camp and moved against Guerrero. Not all that far behind and moving quickly and steadily south was the 7th Cavalry. Colonel Dodd was a relentless driver, and by March 26, his column was moving up the sides of the Sierra Madres across the Continental Divide in the face of freezing temperatures, high winds, and heavy snow.[81]

That evening, Punitive Expedition headquarters received intelligence that a large band of Villistas was on the move toward Guerrero, and Pershing ordered Colonel Dodd to follow up. The report was accurate. Moving rapidly, Villa struck Guerrero before dawn on March 28, catching the garrison asleep and capturing the town without a shot. Other Carrancistas provided more opposition. Across the river at the village of San Isidro, a detachment under Gen. José Cavazos sent the bandits into headlong retreat. While rallying his men, Villa was



At field headquarters near Casa Grandes, Mexico, Lts. Herbert A. Dargue and Edgar S. Gorrell fly past in Signal Corps No. 43.

shot in the leg and badly wounded, possibly by one of the "volunteers" he had impressed when he passed through El Valle several days earlier.[82]

Meanwhile, Dodd's column, 370 officers and men, broke camp at Santa Ana Providencia at 6:00 a.m. on March 28 and marched to Bachíniva. After a short rest, the column pushed on to Guerrero at sundown, hoping to catch the bandits asleep at dawn. The forced march through the Sierra Madres was a killing experience for man and beast. Darkness, freezing rain, and snow dogged the column as it climbed steep slopes and crossed almost impassable terrain. Despite inadequate maps and an unreliable guide, the cavalry covered some fifty miles, but at dawn was still three miles south of Guerrero. Dodd had achieved surprise to this point, but the rough terrain and reluctant guide delayed his assault and gave the Villistas just enough time saddle up. The 7th attacked at 8:00 a.m. Dodd sent his 2d Squadron across the river to block an escape west of the town. He then led the 1st and 3d Squadrons against the main Villista force, which fought a rearguard action that enabled most to escape. Unknown to Dodd, the seriously wounded Villa was encamped with an escort south of Guerrero and escaped the attack. The 7th Cavalry killed fifty-six and wounded thirty-five, at a cost of five wounded men, and drove the bandits into the mountains, where pursuit proved impossible. The brutal night march had left the men and horses exhausted.[83]

While Colonel Dodd marched and fought, Foulois continued to make every effort to fulfill his mission and address deficiencies in his airplanes. On March 27, the 1st Aero Squadron began to transfer its base from Colonia Dublán to El Valle. S.C. Nos. 42 and 53 began the move by flying reconnaissance missions that ended at the new base site. On the following day, Dargue returned to Colonia Dublán from Columbus in the re-engined S.C. No. 43. In turn, S.C. Nos. 45 and

At field headquarters near Casa Grandes, Mexico, April 1916, Lts. Dargue (rear seat) and Gorrell (front seat) prepare to take off in Signal Corps No.43.

52 left for Columbus, the former for a new OXX engine, the latter to replace the lower wing damaged at Ojo Federico. Finally, Captain Dodd flew S.C. No. 44 to Colonia Dublán, where squadron mechanics began a complete overhaul. Half of Foulois's force was thus unavailable. The 1st Aero Squadron still conducted two reconnaissance missions, however. Dargue flew No. 43 from Colonia Dublán to Bachíniva, Namiquipa, and Santa Ana and returned to Namiquipa, where Pershing had moved his field headquarters, a distance of some two hundred miles. Chapman in S.C. No. 53 reconnoitered the area east of Namiquipa from the advanced base at El Valle. On March 29, S.C. No. 45, equipped with its new OXX engine, rejoined the squadron at Colonia Dublán, bringing mail and despatches from Columbus. S.C. Nos. 42 and 53 from El Valle and No. 43 from Namiquipa also brought mail and despatches to Colonia Dublán from those locations.[84]

The 1st Aero Squadron continued primarily to operate up and down Pershing's rapidly lengthening line of communications. On March 30, however, Kilner at Colonia Dublán flew a supply mission. He loaded S.C. No. 42 with mail, dispatches, airplane oil, and fifty pounds of fresh meat for the squadron detachment at El Valle, while Gorrell brought the newly repaired S.C. No. 52 back from Columbus. The only other flight that date was by Chapman, who took No. 53 to Namiquipa with mail and despatches. And finally, the remainder of the 1st Aero Squadron's ground echelon, which had been left at Columbus to assemble Quartermaster trucks, rejoined the unit at Colonia Dublán.[85]

On March 30, Foulois submitted his proposal for the use of the 1st Aero Squadron, which recognized the limits of its six airplanes. He presented Pershing with four options. The first was for the squadron to maintain communications by air between Columbus and the Punitive Expedition's main bases at Casas

Signal Corps No. 43 landing near the 1st Aero Squadron truck train in Mexico.

Grandes, El Valle, and Namiquipa through a system of regular flights. Airplanes based at Casas Grandes would make daily flights to Columbus and Namiquipa, returning the following day, while airplanes based at El Valle would make daily flights to Namiquipa, also returning the following day. The plan dedicated all six airplanes to maintaining communications between bases and left none to scout for Pershing's roving columns as they worked their way south. The second option was for the squadron to abandon communications by airplane with Columbus; establish fuel bases at Casas Grandes, El Valle, and a location south of Namiquipa to be selected later; and concentrate all six airplanes at Namiquipa. From that base, two airplanes would maintain daily communications between Namiquipa and Casas Grandes, and two others would do the same with El Valle. The third option involved the 1st Aero Squadron more directly in Pershing's operations. As soon as the army established radio-telegraph communications through Casas Grandes to Namiquipa, the daily use of airplanes between those points and between Namiquipa and El Valle would be discontinued. All airplanes would concentrate at Namiquipa and would be used to communicate with Pershing's advanced troops as they marched south. Foulois's fourth proposal was less an option than an action to be taken no matter the circumstance. All airplanes would concentrate at the front for reconnaissance when the troops came in contact with the enemy forces. Pershing approved Foulois's third option on April 1.[86] The 1st Aero Squadron continued to move deeper into Mexico.

Although Pershing's decision altered the thrust and direction of Foulois's efforts, the daily pattern of operations remained essentially unchanged. On March 31, five of the six airplanes delivered mail and despatches, while the mechanics overhauled S.C. No. 44. Bad weather hampered operations, however. Carberry and Foulois flew from Colonia Dublán to El Valle in S.C. No. 45

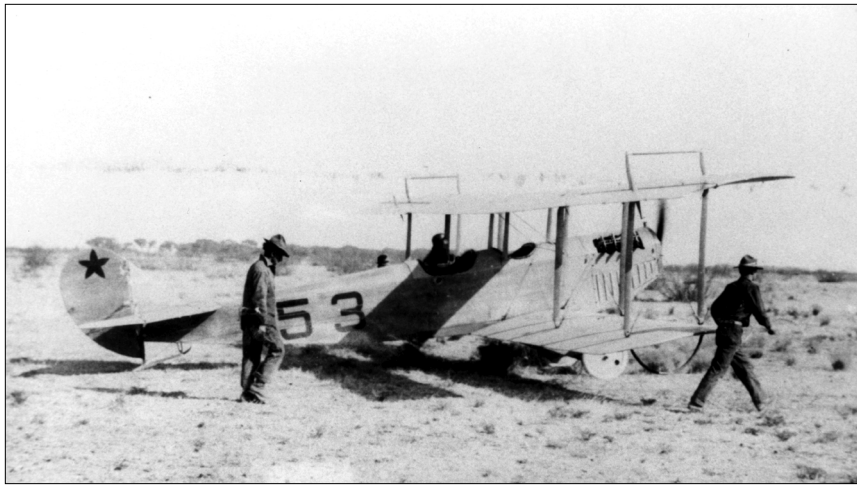
but on the return flight ran into a blizzard in the mountains. Blinded by the snow, Carberry narrowly missed flying directly into a mountain. He landed the airplane at Puerto Escondido, took off again, but was finally forced down at the small village of Espindoleno, about twenty-five miles from Colonia Dublán. The two aviators spent the night with Mexican ranchers. The worried detachment at Colonia Dublán sent out a search party by automobile, but it was unable to locate the missing airmen.[87]

The winter weather continued to affect squadron operations on the following day. That morning, a severe snowstorm forced Dargue to land on a mountain plateau while flying S.C. No 43 from San Geronimo to Colonia Dublán. He did so without damage and then continued his mission after the storm had passed. Subsequently, the grounded Foulois and Carberry reached Colonia Dublán in a Mexican wagon. Dargue then flew Carberry back to Espindoleno, where the latter retrieved S.C. No. 45 and brought it back for a much-needed overhaul. Despite the weather, and belying the fact that it was April Fool's Day, this was the squadron's busiest day to date with a total of nineteen flights by the six airplanes, which accumulated some thirteen hours and thirty minutes of air time between them.[88] This sustained effort suggests that 1st Aero Squadron personnel were beginning to gain the experience necessary to conduct air operations under harsh conditions.

On April 2, Christie in S.C. No 42, flying out of El Valle, reconnoitered the area toward San Geronimo and Las Cruces, while Gorrell in S.C. No. 52 reconnoitered south and east of the base at Bachíniva. S.C. Nos. 43 and 45 remained at Colonia Dublán, while the remaining airplanes delivered mail and despatches.[89]

By then, Pershing's field headquarters was south of Namiquipa at San Geronimo. Earlier he had split his columns into several detachments, creating a wider net to locate the Villista forces, which had broken into small bands. To maintain contact with these fast-moving detachments, Pershing traveled light. His headquarters consisted of an automobile and about thirty men including scouts, guides, and newspaper correspondents. San Geronimo was in the Sierra Madres at an altitude of about 7,500 feet; thus, high winds and heavy snow made it an uncomfortable location. Pershing lacked essentials like a tent, table, and folding chair, while a cowhide stretched between two poles provided just enough shelter for a fire.[90]

The 1st Aero Squadron followed. While several airplanes flew liaison and reconnaissance missions, April 3 and 4 were devoted to moving the squadron's advanced base initially from El Valle to Namiquipa, then on to join Pershing at San Geronimo. The squadron truck train left Colonia Dublán on the 4th and reached Namiquipa about noon on April 5. Foulois immediately ordered it to San Geronimo. All of the airplanes had reached Namiquipa by the 5th, except for S.C. No. 42, which was already at San Geronimo. Dargue and Foulois in S.C. No. 43 flew to San Geronimo on April 5. After their arrival, Pershing ordered Foulois to scout for his advance columns of troops. Again, the squadron succeeded. About seventy miles south of San Geronimo, Dargue and Foulois found William C. Brown's command just as it entered Cusihuiriachic Canyon. They



Lt. Carleton G. Chapman in Signal Corps No. 53 preparing to takeoff at Casas Grande.

flew over to attract attention, landed nearby, delivered despatches from Pershing, then took off with reports from Brown, and returned to headquarters.[91]

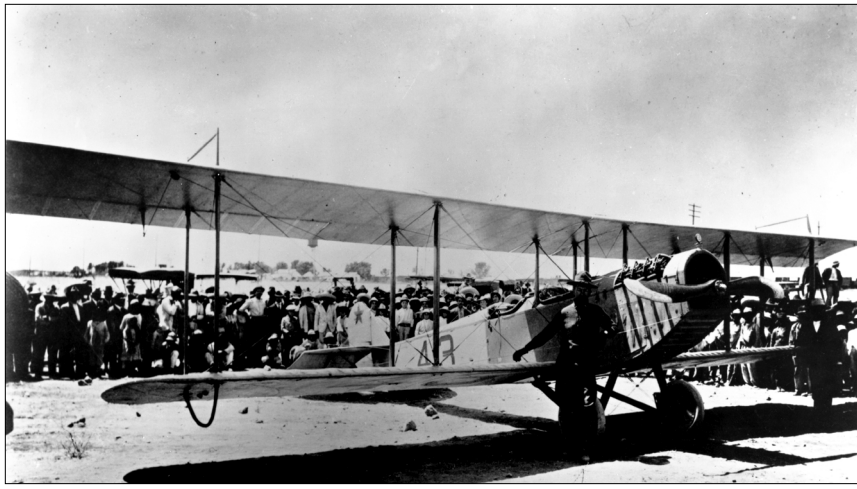
On April 6, the 1st Aero Squadron truck train reached the advanced base at San Geronimo, although the machine shop section appears to have remained at Namiquipa. In the meantime, Dargue and Rader flew to the Cusihuiriachic Canyon area, where they again found Brown's column. This time, however, the terrain prevented a landing nearby, so Dargue set down at the top of the canyon, prepared several parachutes, took off, and successfully dropped the despatches to the column. Despite this success, the day was not without cost. Captain Dodd, accompanied by Lieutenant Kilner, flew S.C. No. 44 from Namiquipa to San Geronimo. During the landing roll, Dodd ran into a ditch hidden by grass, destroying the landing gear and damaging the lower wings. Dodd and Kilner salvaged the engine and serviceable parts, and burned the wreck, reducing the 1st Aero Squadron to five airplanes.[92]

In the meantime, events in Mexico had an impact in Washington, D.C. On April 3, 1916, an article appeared in the *New York World* claiming that several pilots with the Punitive Expedition, including Foulois, Gorrell, Carberry, Dargue, Willis, and Chapman, had complained bitterly to reporters about the deficiencies in their airplanes and blamed most of the problems they faced on the nonflying officers of the Signal Corps who controlled army aviation. One aviator, in particular, presented a satirical picture of Colonel Reber sitting in a swivel chair in his office and designing the airplanes they had to fly. The solution, according to the aviators, was to remove aviation from the Signal Corps. "The aviators, mechanicians, and assistants," who were "more like a family than any organization of the entire army," according to the reporter, were clearly angry and disgusted.[93]

This article ruffled feathers in the War Department. On April 4, General Scott wired General Funston that Secretary Baker wanted to know if the aviators were responsible for the article, and if so, who? Foulois, Chapman, and Carberry all denied talking about army aviation with reporters and disclaimed the statements attributed to them in the article. Gorrell fibbed at first but ultimately admitted that on April 1 he had discussed "foreign aviators, lack of engine power in the aeroplanes of the First Aero Squadron, and military aeroplanes, past and present." This episode quickly passed; the army appears to have determined not to punish the aviators for talking out of turn, while Pershing supported his aviators. He certainly understood the problems the squadron had been experiencing with its inadequate equipment, and it was no skin off his nose if the Signal Corps took a bit of heat. In the final analysis, although there is no evidence that anyone in the army was thinking this way, a public airing of the squadron's problems had the potential to put pressure where it was required: on a Congress that controlled the nation's purse strings. And so it proved. Combined with other developments in the United States, this incident was a step on the road to the release of funds for the modernization of army aviation a few weeks later.[94]

The first week of April found the Punitive Expedition deep in Mexico at the end of an ever-lengthening line of communications, moving south in several separate columns through some of the worst terrain in the state of Chihuahua. By April 7, the supply situation had become so critical that Pershing ordered Foulois to carry a request for assistance to Marion H. Letcher, the U.S. Consul General in Chihuahua City. The largest city in the state, Chihuahua City was about a hundred miles east of San Geronimo. For several days local Carrancista commanders had expressed opposition to the presence of U.S. troops so deep in Mexico, and Pershing and his officers were concerned about the growing hostility they faced. To ensure that Pershing's despatches reached the consulate, a cautious Foulois decided to send two airplanes with duplicate messages. One would land south of the city, the other to the north. Once on the ground, he directed, the observers would carry the messages to the consulate, while the pilots remained to protect the airplanes. Foulois's caution, it would turn out, was fully justified.[95]

Dargue and Foulois in S.C. No. 43 left San Geronimo at dawn on April 7, followed by Carberry and Dodd in S.C. No. 45. The latter airplane landed on the north side of Chihuahua City, and Dodd commandeered a carriage, which took him to the consulate without incident. Foulois and Dargue were less successful. They landed south of the city, but the unexpected arrival of a rare airplane in the hands of gringos caused considerable excitement. A large, hostile crowd, including a contingent of *rurales*, the Mexican national police, quickly assembled. Once on the ground, Foulois ordered Dargue to join No. 45, while he went into the city. As Dargue lifted off, four mounted *rurales* opened fire on the airplane. Foulois convinced the *rurales* to halt their fire, but they arrested him and marched him to the city jail, followed by a mob several hundred strong. On the way, he attracted the attention of an American bystander, who carried word of the arrest to the U.S. Consul General. After a long wait, Gen. Luis Gutiérrez, the



A cool Lt. Herbert A. Dargue posing in front of Signal Corps No. 43 at Chihuahua City. He and the airplane have just been stoned by a hostile crowd. Dargue had the photographer pose him as long as possible to avoid futher mob violence. The mob did not attack while the camera was in use.

military governor of Chihuahua, ordered Foulois's release and agreed to place a guard over the two airplanes.[96]

In the meantime, Dargue had joined Carberry. A huge crowd quickly gathered around the two pilots and their machines, made threatening remarks, burned holes in the cloth with cigarettes, slashed the covering with knives, and extracted bolts and screws. To remain appeared to court disaster, so Dargue and Carberry decided to fly the two airplanes to the nearby American Smelter and Refining Company. Carberry in No. 45 got off safely, but as Dargue took off in a shower of stones, the top section of the fuselage aft of the rear cockpit came off, damaging the stabilizer. Dargue landed safely and then stood off the crowd by himself until Foulois and the guards provided by General Gutiérrez arrived. The observant pilot had noted that the crowd behaved when a picture was taken, so he had a local photographer pose him and his airplane for as long as possible while he waited for help. Dargue then repaired the damaged airplane, while Foulois returned to the city and helped Dodd supervise the loading of supplies aboard railroad cars for Pershing. The two officers spent the night in the consulate.[97]

Dargue and Foulois flew back to San Geronimo on the following day with dispatches for Pershing from Letcher. Carberry and Dodd reconnoitered the area around San Isabel and San Andres during their return flight. Pershing then ordered Foulois to move the squadron to San Antonio de los Arenales, about fifty-five miles south of San Geronimo. This movement took place on April 9. Four airplanes, S.C. Nos. 42, 45, 52, and 53 flew directly to San Antonio de los Arenales, while Herbert Dargue and Ira Rader in No. 43 detoured and delivered

despatches to Namiquipa. The squadron truck train and the enlisted personnel drove to the new camp at Arenales without incident. This move brought the 1st Aero Squadron within easier range of Pershing's fast moving columns, several of which were almost out of touch. On April 9, for example, Frank Tompkins and his detachment of the 13th Cavalry were closing in on Parral, the last large town in the state of Chihuahua.[98]

On April 10, three 1st Aero Squadron airplanes delivered dispatches to several locations along Pershing's line of communications. The other two airplanes went searching for Pershing's detachments. Dargue and Foulois took S.C. No. 43 to the south and southeast on a 175-mile reconnaissance, while Carberry and Dodd in S.C. No. 45 flew a 250-mile reconnaissance to the southeast and east as far Santa Cruz de Villegas, north of Parral. Both efforts to locate troops proved unsuccessful, but Carberry and Dodd came close. That day Tompkins's column reached the small village of Pilar de Concho, northwest of Parral, where his tattered men were able to buy trousers, leggings, boots, shoes, and socks. That night a Carrancista captain met with Tompkins and assured him that his column would meet with a friendly welcome at Parral, that his force could find provisions, and that he could have access to railroad transportation if he needed to move toward Durango further south. An optimistic Tompkins resumed the march toward Parral the next morning.[99]

On Tuesday, April 11, Pershing continued moving his field headquarters south and east to be closer to his columns. Captain Foulois accompanied Pershing in the squadron automobile during the morning, reaching the village of Satevó, over one hundred miles south of Chihuahua City, about 9:00 p.m that night. The 1st Aero Squadron supply train under Captain Dodd arrived about two hours later, but its march had not been without incident. Dodd reported that they had been fired on by Villistas near Cienagas, about fifteen miles north of Satevó, while the crew was salvaging an automobile that had run into a truck. The supply train crew suffered no casualties and returned fire. In the meantime, trouble with Carrancista troops continued. Chapman flew S.C. No. 53 from San Geronimo to Satevó by way of Santa Rosalía de Cuevas, where he landed to check his rudder controls. Suspicious Carrancista soldiers took him to the commander of the local garrison, and during his absence, his field glasses, goggles, and some ammunition disappeared from the airplane. The other major event of the day was accomplished by Dargue and Gorrell, who flew S.C. No. 43. from San Antonio de los Arenales to Colonia Dublán, a distance of 185 miles, refueled, then continued on to Columbus, another 120 miles. The total distance of 305 miles made it one of the longest flights of the campaign to date.[100]

The highlight of April 12 was the receipt of twenty-one new Jeffery four-wheel-drive trucks. Foulois transferred his much-worn old vehicles to the Quartermaster Corps. The new vehicles would prove much less satisfactory than the older trucks, however. Although virtually the same vehicle, the workmanship was inferior. The squadron mechanics had to make numerous modifications and repairs over the next three months, but even with these, the new vehicles lacked the dependability of the earlier trucks. As with the Curtiss Aeroplane Company,

the Thomas B. Jeffery Company (soon to become Nash Motors) was producing huge number of trucks for the war in Europe, and the rapid expansion appears to have diminished quality. Ultimately, following the squadron's return to Columbus, the ground crews worked closely with representatives from Jeffery, conducting comparative tests that would improve the engines and chassis.[101]

Otherwise, April 12 was a relatively quiet day. S.C. No. 43 remained at Columbus, while No. 42 was in reserve status at Satevó, joined later in the day by S.C. No. 45, which Carberry flew down from Tres Hermanos. Willis flew S.C. No. 52 from Namiquipa to San Antonio de los Arenales with despatches, then proceeded to Satevó, while Chapman flew a long reconnaissance mission in S.C. No. 53 to the south and southeast almost to Parral. Following his return to Satevó, Chapman took off with despatches for San Andres, but darkness forced him to land short of his objective.[102]

Again, the 1st Aero Squadron flyers apparently just missed Major Tompkins and his detachment of the 13th Cavalry, which entered Parral on April 12. In contrast to what the Carrancista officer had led them to expect, however, no one welcomed the troops, and Tompkins's meeting with the local commander, Gen. Ismael Lozano, went badly. Lozano professed no knowledge of the promises made to Tompkins, reported that Villa was probably well to the north around Satevó, and told the major he should have never entered Parral. He did agreed to conduct the American force to a camp outside town. A large, threatening crowd assembled quickly, however, and followed the column toward the temporary site a few hundred yards north of the town. Gunfire broke out in the rear of the column, and Lozano left saying he would stop the shooting. Shortly afterward Tompkins noticed a Carrancista force assembling several hundred yards away on his right flank. The major deployed a rear guard and kept his force moving north, while exchanging fire with the Carrancistas and the mob. For the next couple of hours, the cavalry conducted an orderly retreat to Santa Cruz de Villegas, where Tompkins halted and took up defensive positions. His small force lost two men dead and six wounded during the action. Short of rations, water, and ammunition, and without machine guns, Tompkins sent three troopers for reinforcements. These located a squadron of the 10th Cavalry under Maj. Charles Young, whose arrival enabled Tompkins to hold his position. The arrival of the rest of the 10th Cavalry detachment later brought the U.S. strength to about six hundred men.[103]

On April 13, Dodd and Christie reconnoitered toward Parral in S.C. No. 52, but apparently saw nothing unusual, while Chapman in S.C. No. 53 completed the flight to San Andres begun on the previous day. Carberry and Foulois returned to Chihuahua City in S.C. No. 45 with despatches for the U.S. Consul General, the first time an airplane had returned to the scene of the trouble on April 7. Originally, Carberry and Foulois planned to make this flight by way of San Antonio de los Arenales, but the underpowered JN–3 was incapable of the task. What Foulois recorded as "terrific vertical air currents" prevented them from crossing the mountains around San Andres. Abandoning the effort, they flew directly to Chihuahua City, avoiding the mountains. The airmen experienced no difficulty with the Mexican people this time, but at the consulate,

Foulois picked up the first news of the fight at Parral. Letcher also reported that General Gutiérrez, the military governor, was demanding that all U.S. soldiers be removed from his district to prevent other confrontations with Carrancista forces.[104]

On the morning of April 14, Foulois and Carberry flew to Satevó, where they reported the news from Letcher to an angry Pershing, who responded by lifting the censorship that had been placed on the correspondents with the expedition. Until then, Pershing had kept them on a tight rein, especially regarding the hostile encounters with Carrancista troops and officials. Now, correspondents like Frank Elser of the *New York Times* could openly report that cooperation from the Carranza government was a myth. Pershing also dictated a stiff note to General Gutiérrez demanding the arrest of those who had killed and wounded the American troops at Parral. It was Foulois's job to carry Pershing's messages back to Chihuahua City, but this time, short of airplanes, he took the squadron automobile followed by fourteen men in a truck. Aware of the intense feelings in the town over the fight between U.S. and Carrancista troops at Parral, Foulois left the enlisted detachment concealed outside the town and drove to the consulate accompanied only by his driver. He returned to Satevó the same day. Surprised at and concerned about the bluntness of Pershing's words, Consul General Letcher deferred delivery of Pershing's message until he could communicate with Secretary of State Robert Lansing.[105]

At this juncture, on the 14th, Foulois lost two of his five remaining airplanes. Ira Rader flew S.C. No. 52 from Satevó to Boquillo southwest of Parral with despatches for Maj. Robert L. Howze's column of the 11th Cavalry. Rader succeeded in locating Howze's troopers further south, near the village of Ojito, but badly damaged his airplane landing on the rough ground. Unable to make repairs, Rader abandoned the airplane and joined Howze's column.[106] It was a poignant day for No. 52's regular pilot, "Nap" Gorrell, who was temporarily at Columbus: "No. 52, was taken up by one of my comrades," he wrote years later. "As he landed alongside the troops at Paral [sic] he smashed and the bones were left to lie and mark the southernmost point of the American advance after Villa."[107] S.C. No. 42 came to a more prosaic end. A board of 1st Aero Squadron pilots, assembled for the purpose, agreed that the airplane was beyond repair. It was salvaged for parts and destroyed. The lower wings were mounted on S.C. No. 45, replacing those damaged by the mob during the mission to Chihuahua City on April 7. These developments left Foulois with three airplanes, two at Satevó and the third temporarily at Columbus.[108]

The shortage of airplanes on April 14 forced Foulois to send Lieutenant Willis and a detachment toward Parral by automobile with despatches for Colonel Brown. The most successful aviation work accomplished that day took place at Columbus, when Lieutenants Dargue and Gorrell flew S.C. No. 43 into Mexico to reconnoiter the passes to the west, in an effort to locate a Carrancista force reported to be threatening Pershing's line of communications from that direction. This 315-mile flight set a U.S. record for distance with a passenger, but failed to locate a hostile force.[109]

On Saturday, April 15, the 1st Aero Squadron's three remaining airplanes were busy. Dargue and Gorrell returned to Satevó from Columbus in No. 43, detouring to the west in an effort to locate Carrancista troops reported to be in the Pulpit Pass area. Again, they found nothing, convincing evidence that the hostile force reported in the area was a mirage. The two men reached Satevó that evening after stops at Colonia Dublán and Namiquipa. In all, S.C. No. 43 covered 435 miles during the day. Also, that day Captain Dodd and Lieutenant Carberry flew despatches from Satevó to San Antonio de los Arenales, then on to Namiquipa in No. 45, while Lieutenant Chapman flew dispatches in the opposite direction, from San Antonio de los Arenales to Satevó in No. 53. On the following day, Carberry and Dodd carried despatches from Namiquipa to Satevó in No. 45, while Chapman did the same from San Antonio de los Arenales to Namiquipa in No. 53.[110]

But the Punitive Expedition's advance south was at an end. On April 16, Pershing left Satevó and started back to Namiquipa. Following the fight at Parral, he realized that his situation had changed. With the Carrancista government and the people throughout Chihuahua openly hostile, his force faced a potentially serious threat to its extended line of communications. For Pershing, it was no longer a question of controlling swift columns of cavalry from his mobile headquarters in a Dodge automobile. His troops were now spread from Santa Cruz de Villegas more than 100 miles to the west to the other side of the Sierra Madres, and detachments extended more than 400 miles back to New Mexico. Fifteen thousand Carrancistas were known to be around Monterrey in Nuevo Leon, and, potentially, General Obregón could be astride his line of communications in a day. He needed either to secure major reinforcements and expand operations, or to consolidate his force around central points that could be supported and reinforced, if necessary, from the United States. Pershing reached Namiquipa at dawn the next morning.[111]

The 1st Aero Squadron followed Pershing north, helping to maintain communications as it went. On April 17, Dodd, Willis, Kilner, and Christie led the squadron truck transport and enlisted personnel from Satevó, reaching the base at San Antonio de los Arenales that evening, a distance of eighty-four miles by road. Dargue and Foulois in S.C. No. 43 delivered dispatches from Satevó to Pershing at Namiquipa, while Carberry and Gorrell flew S.C. No. 45 from San Antonio de los Arenales to Namiquipa. On April 18, both No. 43 and 45 returned to San Antonio de los Arenales successfully, but heavy winds and sandstorms throughout the day hampered flying.[112]

The following day, April 19, saw the end of "Old No. 43," perhaps the most reliable of the 1st Aero Squadron's airplanes. Dargue and Willis took off at dawn to reconnoiter the roads and approaches to Chihuahua City. They accomplished the mission, even taking several photographs from the air using a new Brock automatic aerial camera, which produced a sequential series of photographs at predetermined intervals. Dargue then attempted to follow the roads west of the city through the foothills toward San Andres. Once in the rough terrain of the foothills, however, No. 43's engine began to vibrate and lose power. Dargue

attempted to reverse course and return to more open country, but the loss of power and severe downdrafts prevented him from reaching flat ground. Dargue landed on the side of a mountain at a 45-degree angle, completely wrecking the airplane. A thoroughly shaken Dargue escaped without injury. Willis, however, was trapped within the wreckage, caught between the engine bed and gas tank. He received a severe scalp wound and bruises on his legs and ankles. The Brock camera was smashed and the plates ruined. Dargue extricated his injured partner, set fire to the wreck, and he and Willis began to walk to San Antonio de los Arenales, about sixty-miles distant. After hiking for two days and nights without food or water, the pair finally struggled into San Antonio de los Arenales on April 21 completely exhausted. Most of the 1st Aero Squadron was gone by then. The squadron truck train had driven to Namiquipa on the 19th. The airmen remained at San Antonio de los Arenales, recovering, until April 23, when they took an automobile to Namiquipa and turned in their reports to Pershing's headquarters. In a postscript to the accident, the fire Dargue set spread to the surrounding trees, leading to what an official report later called one of the largest forest fires in Mexico. Some forty square miles of the mountain burned.[113]

On April 20, Pershing's headquarters ordered Foulois and the 1st Aero Squadron to return to Columbus, where new airplanes were waiting. Only two of the original eight JN–3s had survived the one-month excursion into Mexico, and these were pretty much worn out. Carberry in S.C. No. 45 and Chapman in S.C. No. 53 flew to Columbus. Foulois, the remaining officers, and the squadron enlisted personnel left Namiquipa in the truck train and reached Columbus on April 22. Lieutenant Carberry checked into the base hospital, suffering from asthma. S.C. Nos. 45 and 53 were surveyed, salvaged, and destroyed.[114]

In the meantime, a frustrated Pershing wrote General Funston that to continue, he had to seize complete control of the territory. Accordingly, he proposed to occupy the state of Chihuahua and take over the railroads. This proposal, a major escalation over the original purpose of the Punitive Expedition, threatened a commitment in Mexico far beyond anything President Wilson had anticipated and threatened to lead to something no one really wanted: a shooting war with Carranza's forces. At the President's direction, General Scott hurried to Texas to

The 1st Aero Squadron's facilities at Columbus, New Mexico, 1916.

meet with Funston and survey the situation for himself. On April 22, Scott reported to Baker that Pershing's latest recommendation to drive through by force and seize the Mexican railroads would not lead to Villa's capture; and that the other extreme, to withdraw the Punitive Expedition from Mexico completely, was dishonorable because it would involve knuckling under to Mexican pressure. The remaining option was for Pershing to concentrate his force in the northern part of Chihuahua, where it could be supplied from Columbus, could remain indefinitely, and would appear less threatening to the Mexican government. Scott favored this option because it minimized the chance for war, while the U.S. presence would encourage Carranza to run Villa to earth. Wilson approved and Baker directed Scott to issue the necessary orders.[115]

On April 29, Pershing broke up the provisional cavalry columns, reassembled his cavalry into their regimental organizations, and assigned each an area of responsibility in central Chihuahua. The 7th Cavalry was ordered to Guerrero; the 10th to Namiquipa; the 13th to Lake Bustillos; the 5th to Satevó; and the 11th to San Francisco de Borja. From these centers of operation, the concentrated regiments controlled an area roughly a hundred miles long and thirty miles wide, with its line of communications and a system of intermediate bases and depots stretching back to Columbus. The new arrangement resembled the strategy Pershing had used successfully against the Moros in the Philippine Islands. For the next nine months, cavalry detachments patrolled their areas of responsibility aggressively, but further movement to the south in search of Pancho Villa's band came to an end.[116]

The Punitive Expedition—Phase Two

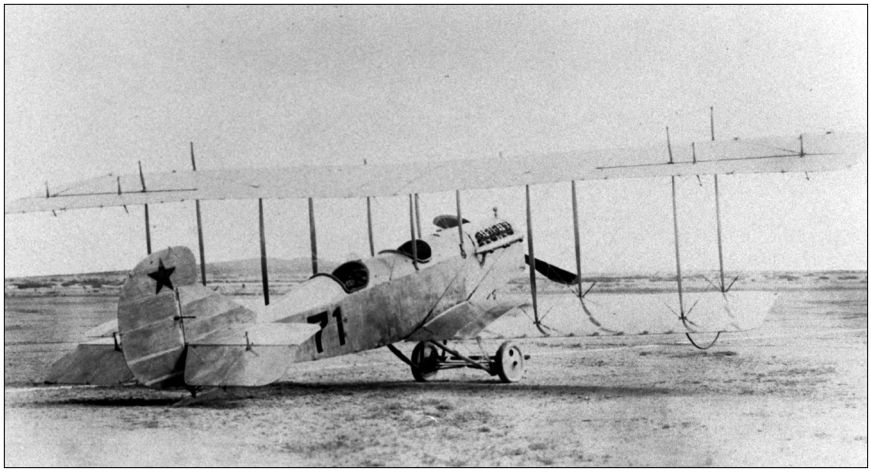
While the Punitive Expedition searched for Villa and his men, events in the United States provided some help for the 1st Aero Squadron. Pershing had forwarded Foulois's March 22 memo requesting ten airplanes with more powerful engines (see page 26) to the War Department. And, as the Punitive Expedition and 1st Aero Squadron moved deeper into Mexico on the ghostly trail of Pancho Villa, "Black Jack's" message set wheels in motion. Secretary of War Baker was following the squadron's activities closely. In response to Pershing, Baker sought Funston's opinion on the need to send modern airplanes and the number required. The reply from the nonflying Funston was scarcely helpful and showed considerable misunderstanding of the requirements of military aviation. Funston agreed that "four modern and thoroughly efficient aeroplanes with competent aviators" should be sent to Pershing immediately, with four more on the border, and four in reserve at San Antonio de los Arenales. As for pilots, Funston, knowing that most of the experienced ones were already in Mexico, suggested that the Quartermaster Corps hire civilian pilots![117]

A few days later, Foulois closed his March 30 proposal to Pershing (see page 32) with another "urgent appeal" for "at least ten of the highest powered, highest climbing and best weight carrying aeroplanes that can be secured and purchased in the United States," and promised that when the new airplanes

arrived, his unit would "increase its effectiveness to this expedition at least five hundred percent."[118] On the following day, Congress took action to deal with the deficiencies reported from Mexico. On March 31, it passed the Urgent Deficiency Act, which provided the army with $500,000 for the immediate purchase of twenty-four airplanes, eight for the 1st Aero Squadron. In addition to airplanes, the money was to be used to equip the squadron with additional motor trucks, portable machine shops, automatic photographic cameras, machine guns, rifles, bombs, and other materials.[119]

The initial practical result of this legislation was the delivery of the Jeffery vehicles to Foulois on April 12 (see page 38.) The first of the new airplanes reached Columbus, New Mexico, just prior to the 1st Aero Squadron's return. These were four Curtiss N–8s, S.C. Nos. 60-63, which were essentially variants of the JN–3 with a different wing and airfoil and powered by a 90 hp OXX engine. The squadron personnel devoted Easter Sunday, April 23, to reorganizing the squadron transportation, clearing up reports and correspondence, and unloading and assembling the N–8s. Tests conducted over the next six days, however, verified that these were incapable of meeting the operational conditions in Mexico. On May 1, a board headed by Captain Dodd formally concluded that the Curtiss N–8 was too slow and underpowered and the landing gear too weak for rough terrain. The squadron packed up the N–8s and shipped them to the Signal Corps Aviation School at San Diego.[120]

On the same day that the board condemned the N–8s, the first of twelve Curtiss R–2s reached Columbus.[121] The R–2 was a larger, modified version of the original Curtiss Model N powered by a 160 hp VX engine, a larger version of the basic Curtiss OX.[122] Foulois and the 1st Aero Squadron spent the next three months fighting problems with the new airplanes. The catalogue of deficiencies was enormous and inexcusable. The R–2s were short such basic parts as locking rings, bracing wires, dry cells, compasses, screws, bolts, bulbs, propeller hubs, and assorted wrenches and other specialized tools. Further, most of the airplanes were poorly constructed from shoddy materials. In just some examples, the soldering of leads and joints was amateurishly done, some lateral control wires were too long, ailerons were misaligned and warped, and bracing inside the fuselages was poor. Problems with overheating forced the mechanics to install a bypass to the water pump, and Foulois ordered new radiators from Curtiss with a larger surface area. The "breaker cams" on the magnetos had to be altered to prevent irregular firing, and more reliable magneto switches had to be installed. In three cases, the ignition system had been incorrectly wired, and several mechanics narrowly escaped injury. Virtually all of the truss wires on the airplanes had been spliced, a dangerous practice, and in several cases these pulled out of their fittings while the airplanes were merely sitting on the ground. Beyond these problems, three engine crank cases had split; the wheels on two airplanes had collapsed, and the landing skids on two other airplanes were cracked. Also, the rudder posts on three airplanes were broken, forcing the squadron mechanics to replace those on all of the airplanes. Clearly, Curtiss had lost control of quality at the manufacturing plant, and whatever inspection sys-

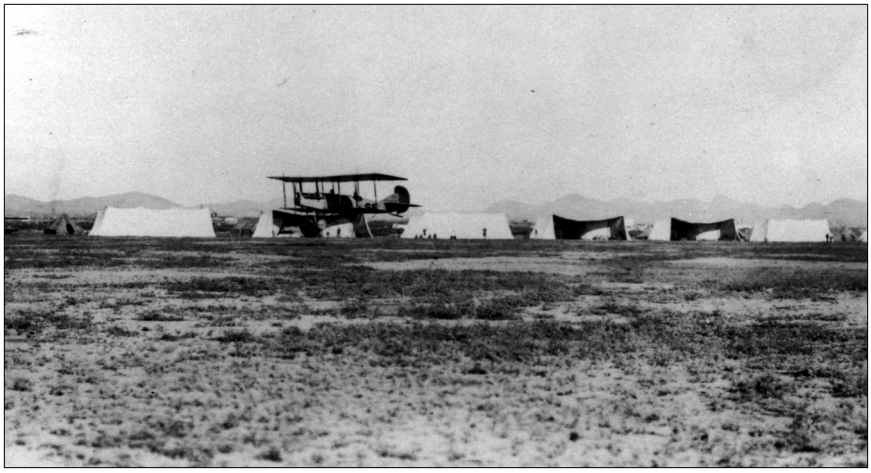


A Curtiss R–2, Signal Corps No. 71, at Columbus, New Mexico.

tem existed had failed miserably. Finally, beyond addressing the deficiencies of its airplanes, squadron personnel also had to replace the Curtiss control system with the Deperdussin universal stick system, since the Curtiss shoulder yoke provided insufficient positive control in the roll axis for the larger airplane.[123]

The mechanics immediately began overhauling the new airplanes, but they had to do so in the face of a serious shortage of specialized tools. The mobile machine shop had proven worth its weight in gold while in Mexico, but it was designed and equipped for field repairs. No one had envisioned that it would have to accomplish complete rebuilds on airframes or major engine overhauls. The squadron lacked the machine tools necessary for more extensive work. and the few remaining tools were badly worn. By July, Foulois would complain that some airplanes were out of commission because he was short the tools necessary to get them back in the air.[124]

The biggest problem that Foulois faced with the new airplanes, however, was with the propellers. The hot, arid climate dried the wooden blades and dissolved the glue, causing the wooden propellers to warp and the laminations to separate. From May through July, the 1st Aero Squadron struggled with this dangerous problem. All of Foulois's airplanes were out of commission from May 10 through May 15 with faulty propellers, and of the twenty-nine propellers received in May and June, only two passed their tests. Then on June 19, one of the R–2s, S.C. No. 70, took off at Columbus. Thirty-five minutes into the flight, a blade of the propeller, manufactured by the Paragon Propeller Company, broke completely off near the hub. The engine tore from its mounts and dangled below the landing gear, suspended only by cables and metal supports. The pilot, Lieutenant Chapman, managed to land uninjured, but the airplane was completely wrecked. Foulois once again complained about Curtiss, and Lt. Henry W. Harms, serving as Signal Corps inspector at the Curtiss Factory, reported that



A Curtiss R–2 takes off at Columbus, New Mexico. Note the hangar tents to the rear.

since the Curtiss Company did not build the propellers, it felt no obligation to test them. Once more, Foulois was forced to do in the field what should have been accomplished at the factory. He ordered materials and had his men construct an engine test stand.[125]

However, since the problem threatened the company's reputation, Curtiss also took action, sending three civilian propeller experts, who arrived in Columbus on June 29. Using Foulois's engine stand and working with his men, they immediately began building and testing propellers. Experiments with many types of wood, glue, and construction techniques yielded progress, and by late summer the operation was producing satisfactory propellers. During the process, Foulois's men collected data on durability for future use by the War Department. Additionally, Curtiss continued to furnish propellers from several sources for testing. On July 22, for example, the company shipped four, and twenty-two more were on their way by August 1. The test stand built by squadron personnel proved invaluable for this process, as well as for engine testing.[126]

In midsummer, another problem cropped up. Rain at Columbus on July 8 melted the waterproofing that had been applied by the factory to the cloth covering the airplanes, allowing water to penetrate to the wood on the interior. Foulois reported this problem to Mr. J. W. Scott, the Curtiss representative at Columbus, and Curtiss sent replacement aircraft dope by express.[127]

These critical deficiencies had repercussions in Washington, D.C. Herbert Dargue, who had returned to the War Department by mid-summer, found that Foulois's report on the R–2s had stirred up the Signal Office about the Curtiss Company's miserable performance. Foulois's complaints were buttressed by other reports. Capt. Virginius E. Clark, the first air officer to graduate with an aeronautical engineering degree from the Massachusetts Institute of Technology,

had carefully inspected the propeller department at Curtiss and had given company officials detailed instructions for producing military propellers. Clark reported that Curtiss's "propellers were made in a rotten way and [he] did not wonder at the breakage."[128]

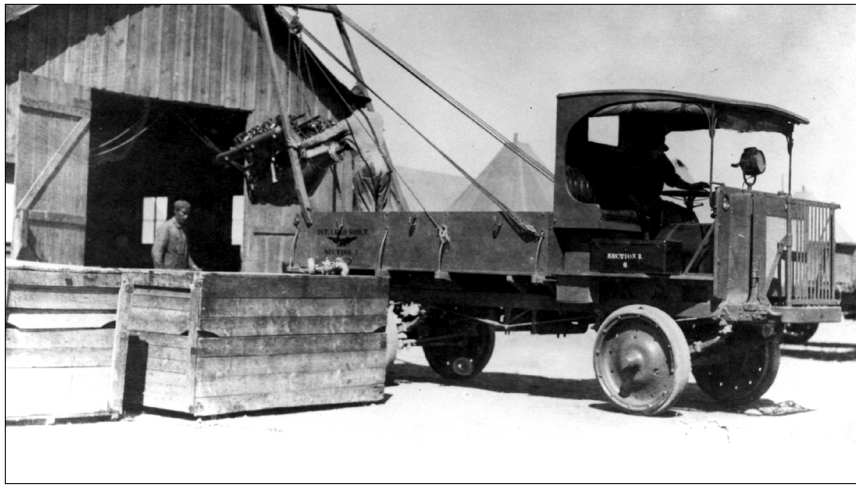
Beyond wrestling with the R–2s and propellers, the 1st Aero Squadron experimented with a variety of other airplanes and aviation equipment. In addition to the R–2s, Foulois received three Standard H–2s, six Curtiss twin-engine JNs, about seven Curtiss JN–4 "Jennies," and others from Martin, Sturtevant, Thomas, and LWF. All told, counting the four Curtiss N–8s, the 1st Aero Squadron received fifty-one airplanes at Columbus by April 6, 1917. Aviation equipment included more Brock automatic cameras, which took a continuous string of pictures along the airplane's path that could be pieced together to show detail over a relatively long distance. Foulois's men experimented with enlarging the photographs and transferring the results to a map. Also, by mid-August the squadron had received about a hundred three-inch artillery shells rigged out as bombs, which, according to Gorrell, no one quite knew what to do with. Additional bombs arrived later, and others appear to have been manufactured locally. The squadron also received twelve .30 caliber Lewis machine guns, a standard aerial weapon on the Western Front by 1916. Gorrell later claimed that, in his capacity as squadron supply officer, he had wangled them out of the Ordnance Department, and they represented about 50 percent of all of the army's machine guns. In any event, all of these were for test purposes only, and none were used on active operations.[129] A newspaper correspondent who reported in late August that the squadron was "as completely, if not more completely equipped than any squadron of any other country in the world" and also claimed that each airplane carried a pilot, an observer, and a Lewis machine gun appears to have overstated the case a bit.[130]

Foulois's experience with the Punitive Expedition in the spring and summer of 1916 led him to re-evaluate the status of aviation under operational conditions, and he submitted his views to the Chief Signal Officer on June 21. In effect, Foulois was dealing with two independent, but related missions. The first was actual operations with a mobile force in the field. Accomplishing this mission required a larger, more mobile aero squadron of twelve rather than eight airplanes. The squadron strength had to be increased to eighteen officers, twelve of them pilots, and 160 enlisted personnel. For ground transport, the squadron needed a minimum of twenty-five trucks, twenty-four trailers, six motorcycles, and an automobile. Among the trucks, he wanted one mobile kitchen, one fuel truck, and four mobile machine shops. Further, the field squadron had to limit its duties to the operational requirements of active service, and its airplanes had to be ready for service when the squadron received them. In the future, he wanted all airplanes destined for field service to be tested under the severest conditions expected in the field, not at sea level over favorable terrain under ideal conditions. No airplane should be accepted unless it had undergone such tests, and the manufacturer had to make any modifications required to prepare the airplanes it produced for field service.[131]

A rough landing wiped out the landing gear of this Curtiss R–2 at Columbus, New Mexico.

At Columbus, Foulois's men were doing double duty, trying to operate a mobile field force on the one hand, and operating a support base with an operational test and evaluation program on the other, and he lacked the trained officers and men to operate both. Thus, his second recommendation was perhaps most important. He saw the necessity for a support base manned, equipped, and commanded separate from the squadron. In his words, "one or more aero squadrons, operating in the field should have a base, conveniently located, from which all supplies, material, and personnel should be drawn."[132] The base should not only provide support for the squadrons, but should also be fully prepared to receive, assemble, and test new engines and airplanes and to make major modifications and repairs when necessary. The base shops must be maintained and operated by a base group independent of the squadron, and the squadron must receive a continuous flow of engines, parts, materials, and spares from sources of supply across the nation. Foulois also envisioned the need for an ordnance officer devoted entirely to aviation work and additional inspectors at airplane and engine factories.[133]

Foulois reported that his squadron would be unable to return to the field with Pershing unless such a base was established separate from the 1st Aero Squadron. Lacking a separate base, Foulois planned to leave his squadron at Columbus and send detachments to the field. In early August, he flew to the Punitive Expedition headquarters at Colonia Dublán and met with Pershing. The result of their discussion was a decision that the 1st Aero Squadron would maintain two airplanes at Colonia Dublán, while the main squadron would remain at Columbus, and Foulois would rotate airplanes and pilots to the advanced station. This would give the newer pilots experience with operations and allow for repair and major overhauls at Columbus. This was done, and in the waning days of August 1916, when Pershing held a formal review of his troops, three airplanes for the first time passed in review, as well. The 1st Aero Squadron remained at



A derrick mounted on the rear of a Jeffery truck turned it into a crane capable of moving an engine to and from the machine shop at Columbus, New Mexico.

Columbus, with a detachment in Mexico, until Pershing withdrew the Punitive Expedition from Mexico in early February 1917.[134]

Foulois, left the 1st Aero Squadron in September 1916, long before the Punitive Expedition withdrew, but there is a curious footnote to his sojourn in Mexico worth recounting. On May 12, 1916, General Scriven wrote the signal officer for the Southern Department complaining about the 1st Aero Squadron's expenditures in Mexico. This letter, written for Scriven by a nonflying staff officer who had become temporary head of the Aviation Section, questioned why Foulois was buying gas and oil on the commercial market instead of through the Quartermaster Corps as required by regulations. Further, the letter reminded Foulois that the money made available to him could be spent only for repairs, supplies available locally, and temporary labor. It was not to be used for new equipment, supplies unavailable locally, or parts from manufacturers, all of which had to be ordered through the Aviation Section.[135]

Stung by the charges and implied rebuke, an overly sensitive Foulois responded immediately and vehemently. He reported that the army supply system provided poor support for the squadron, the immediate need for parts and supplies precluded going through Washington, and his expenditures were made at firms throughout the United States to ensure the best prices and quick delivery. All purchases were made under his direct supervision in compliance with the proper authorities, he affirmed, and he reminded headquarters that the Chief Signal Officer had approved all expenditures through March 1916 and forwarded them to the Treasury Department for settlement. Foulois went on to describe the poor condition of his airplanes, equipment, and transports when the unit left San Antonio de los Arenales and emphasized the wear, tear, and loss incident to

service in the rough terrain of Mexico. The situation, he reported, was compounded after the return to Columbus and the receipt of new airplanes, each of which required major overhauls. Expenditures outside official channels had been unavoidable. Finally, he had to have gasoline and oil to operate the squadron hundreds of miles in Mexico, and the quartermaster could furnish gasoline only for automobile engines, not the type necessary for airplane engines. In his view, his mission justified extraordinary measures. [136]

Apparently Foulois's answer was satisfactory; the matter appears to have been dropped. But when he returned to Washington, D.C., Foulois made a special effort to find out about this desk-bound groundling who had the gall to question his expenditures while he and his men underwent great hardship in the field. The culprit turned out to be a certain Capt. William "Billy" Mitchell, a highly regarded—and highly opinionated—General Staff officer who had been appointed temporary head of the Aviation Section on April 3. Foulois quickly developed considerable dislike and disrespect for both Mitchell and his methods of operation. He had known Mitchell at least since 1908, but the enmity between the two men that would so seriously handicap the development of the Air Service, A.E.F., in France during World War I dates at least from this incident.[137]

A Summing Up

The Punitive Expedition is often portrayed as a failure because Pershing's force failed to capture or kill Pancho Villa. This view is something less than the truth. While Secretary Baker later wrote that Pershing's mission was to catch Villa if possible, Pershing's orders from the War Department had directed him only to pursue and disperse the band of raiders that had attacked Columbus, not to eliminate Villa. A systematic analysis of the 485 raiders who attacked Columbus, most by individual name, concluded that in addition to the 69 bandits captured and killed during the fighting in Columbus on March 9, the Punitive Expedition had killed 248 and taken 19 prisoner by July 31. One has to conclude, based on these figures, that Pershing had accomplished the letter of his orders. On the other hand, Villa was the focus of the Punitive Expedition to the U.S. public and the media, and since the Punitive Expedition failed to run him to earth, Pershing's campaign has gone down in the popular mind as something less than a success.[138]

Later, Secretary Baker further stated that the real purpose of the Punitive Expedition was to demonstrate U.S. power in a situation where much of Mexico was wracked by violence and outside the control of a legitimate constitutional authority, and to eliminate raids into United States territory. In this effort, it had only transitory success. Pancho Villa soon recovered from the wound suffered at Guerrero, and in a few months had assembled considerable strength throughout Chihuahua. He and Zapata thus continued to pose a serious threat to Carranza. Trouble along the border did abate for a time in the wake of Pershing's expedition, but by 1918 turbulence had reached an all time high. A major battle took place in August 1918 when 800 U.S. troops fought 600 Mexicans near Nogales,

Transporting newly arrived Curtiss JN–4 aircraft from the rail head to the 1st Aero Squadron camp at Columbus, New Mexico, using Jeffery trucks, late 1916.

Arizona; and in June 1919, some 3,500 U.S. troops disbursed a force of about 1,600 Villistas that had attempted to capture Ciudad Juarez across the border from El Paso, Texas. Trouble along the border with Mexico ended only when stability returned to Mexico in the early 1920s.

Violence ultimately ended the lives of almost all of the major Mexican revolutionary leaders. In April 1919, Carranza had Zapata killed, and he himself was assassinated during a rebellion in 1920. Villa retired from fighting in 1920, but still met his end by an assassin's bullet in July 1923. The most astute of the revolutionary leaders, Álvaro Obregón, served as President of Mexico from 1920 to 1924 and was elected again in 1928, but a religious fanatic, convinced that Obregón was the Antichrist, shot and killed the former general in July of that year.[139]

For the U.S. Army, the Punitive Expedition provided a training ground for officers and enlisted men and a laboratory for military equipment ranging from trucks to airplanes to radios to machine guns that would alter the way it fought. Perhaps most significant, the Punitive Expedition solidified John J. Pershing's standing within the Wilson administration. According to Secretary Baker, Pershing's military record and his willingness to accept orders, even the most unpalatable, were the major factors in his selection to command the American Expeditionary Forces sent to France in mid-1917. Neither Baker nor Wilson had yet met in person the man they selected, but in Mexico Pershing had proven himself competent, trustworthy, and loyal.[140]

The mission of the 1st Aero Squadron during the Punitive Expedition was primarily one of communications and observation, and during the first phase of the Punitive Expedition the 1st Aero Squadron was of considerable help in enabling Pershing to keep in touch with his thinly spread, fast-moving troopers. The squadron also performed several reconnaissance missions, and although these failed to locate enemy forces, that information in itself was important for

the commander to know. The second phase of the Punitive Expedition was probably most important for the squadron, because the officers and men gained experience and knowledge by experimenting with a variety of airplanes and aviation equipment.

Pershing's report on the Punitive Expedition concluded that serious problems bedeviled the 1st Aero Squadron in Mexico. Its airplanes were few, old, underpowered, and incapable of satisfactory operation under field conditions. The squadron organization was imperfect, equipment for repairs was inadequate, and the unit was deficient in parts and supplies.[141] Despite these problems, Pershing concluded that Foulois's command had done extremely well, primarily because of the high quality and enthusiasm of the unit's personnel. The 1st Aero Squadron was not always able to complete every mission undertaken, Pershing reported, but that was because of the inferior equipment, not for lack of effort:

> *Under the difficulties of aviation experienced, the service rendered must be considered as most exceptional. The personnel has displayed the most commendable spirit, and personal efficiency is of the highest order. Officers have literally taken their lives in their hands without hesitation, although several aviators have had narrow escapes. Unstinting praise for the aviators who have served with this Expedition is universal throughout the Command.*[142]

Foulois, too, reported the squadron did some excellent work, both in scouting and providing communications, especially thanks to his officers and men. Their efforts, he believed, had an impact that went far beyond the Punitive Expedition.

> *The work of the 1st Aero Squadron proved beyond dispute to the most hardened former soldier and congressman that aviation was no longer experimental or freakish. There is no doubt in my mind that the support later given to the Air Service by both General Pershing and Secretary Baker had its roots in the performance and determination of my splendid crew.*[143]

The Punitive Expedition was the U.S. Army's first effort to use aviation during field operations, and it is important to keep the operation in perspective. It was minuscule when compared with developments in Europe. By March 1916, World War I was entering its twentieth desperate month, and the combatant nations were locked in massive battles of attrition that in the end would cost them a generation of young men. Casualties on the ground were already counted in the millions, and no end appeared in sight. The intensity of the combat had extended to the struggle in the air, and the combatants had expanded, modernized, and diversified their air forces. Reports from airplanes had contributed directly to the Allied victory on the Marne and the German victory at

The Punitive Expedition was a herald of things to come. Gen. John J. Pershing, Commander, American Expeditionary Forces (AEF), and Brig. Gen. Benjamin D. Foulois, Commander, Air Service of the AEF at Issoudun, France, 1918.

Tannenbaum in late 1914; and by 1916, ground commanders accepted airplanes designed specifically for observation and reconnaissance as absolute necessities. The success of observation airplanes had, in turn, led to the development of smaller, faster pursuit airplanes designed specifically to seize control of the air for friendly airplanes or to deny the enemy access to the air. Specialization had progressed so quickly that the newest generation of airplanes would make 1916 the "year of the fighter." Further, all air forces had begun bombing enemy positions, troops, and infrastructure early in the war; by 1916, specialized bombers had been developed for tactical use at the front. Beyond this development, Germany had begun the strategic bombardment of England with lighter-than-air Zeppelins in 1915; and by late 1916, long-range multi-engine bombers would begin replacing the dirigibles in that role. In short, the airplane had assumed by 1916 a central, if not yet decisive role, in modern combat.[144]

Compared with these developments, Foulois's eight unarmed airplanes paled in significance, and the condition of U.S. military aviation at the end of the Punitive Expedition had not improved significantly. When the United States declared war on the Central Powers on April 6, 1917, two months after Pershing's force marched out of Mexico, army aviation had 65 officers and 1,100 enlisted men and civilian technicians. Only 26 of the officers were pilots. Further, through the end of 1916, the U.S. Army had ordered a total of 346 airplanes, of which 299 had been delivered. The Army had ordered 80 of the most advanced available, the Curtiss JN–4 "Jenny," which was developed from the JN–3 that Foulois had taken to Mexico. Other changes pointed toward improvements. The National Defense Act, ratified in June 1916, authorized $13 million for aviation, an increase to 148 flying officers, and the creation of 8 aero squadrons. But all of this was a mere "drop in the bucket." The "Jenny" was an unarmed, somewhat underpowered training plane, incapable of appearing within ten miles of the Western Front and surviving. And if the United States went to war, $13 million, 148 officers, and 8 squadrons were going to provide a mighty small nucleus upon which to build.[145]

The deficient, unsuitable airplanes the 1st Aero Squadron took to Mexico also served as a warning for the future. The U.S. aviation industry at the end of 1916 consisted of fewer than a dozen firms, only a handful of which—Curtiss, Martin, Wright, and Sturtevant, for example—had produced a reasonable number of airplanes. Many politicians, business leaders, newspapermen, and some military officers believed aviation production could be expanded overnight, if necessary. Officers within the Aviation Section knew better, based upon experience. On May 12, 1916, Lieutenant Harms, then an inspector at the Curtiss factory, wrote his friend, Lieutenant Gorrell, in New Mexico that the difficulties in getting even a small number of airplanes to Foulois in reasonable time had illustrated a serious problem with much of the thinking in Washington. In Harms's words,

> *I hope that this present series of delays and troubles will convince our Washington friends that their pet theory of a possible production of 20 aeroplanes a day in case of necessity, is another exploded idea with "nobody home." All of our stuff so far has been taken out of British orders almost ready for shipment. If we were made to wait for complete production you would have received the first shipment next XMAS.*[146]

Since Curtiss was the largest airplane manufacturer in the nation and, in fact, was the only firm capable of producing airplanes of any sort in large numbers, the airplane production and quality control problems in mid-1916 boded ill for U.S. aviation should the nation be drawn into the war in Europe, as many military and civilian leaders feared and expected.

1. Capt. Benjamin D. Foulois, Handwritten Diary, "Mexico (1916), 1st Aero Squadron," Box 2, The Papers of Benjamin D. Foulois, Library of Congress (LC). This diary provided the basis for two official reports. The first was "The First Aero Squadron War Diary, Period from March 18 to April 23, 1916," submitted by Foulois to the Division Adjutant, Punitive Expedition, on July 26, 1916. A copy is in Folder 5, Box 8, MS 17, Benjamin D. Foulois Papers, Air Force Academy Library (AFAL). Later Foulois prepared the "Report of Operations of the First Aero Squadron, Signal Corps, with Punitive Expedition, U.S.A., for Period March 15 to August 15, 1916," dtd.: August 28, 1916. This document is less detailed than the "War Diary," but provides additional material on squadron activities after its return to Columbus from Mexico. It is found in the Ernest A. Jones Collection, 168.65011-7A, Microfilm Roll A1771, Frame 1111, Air Force Historical Research Agency (AFHRA). Hereafter cited as Report of Operations, Jones Collection, AFHRA. A severely redacted version of this last document was published in Maurer Maurer, *The U.S. Air Service in World War I*, 4 vols. (Washington, D.C.: Office of Air Force History), pp. 75-78. An official monograph on the Punitive Expedition is Robert S. Thomas and Inez V. Allen, *The Mexican Punitive Expedition Under Brigadier General John J. Pershing, United States Army, 1916-1917, Chapters I thru V* (Washington, D.C.: Office of the Chief of Military History, May 1, 1954). Perhaps the best available history of the Expedition is Herbert Malloy Mason, Jr., *The Great Pursuit* (New York: Random House, 1970). Clarence C. Clendenen, *Blood on the Border: The United States Army and the Mexican Irregulars* (New York: The Macmillan Company, 1969) places the event in the larger context of United States relations with Mexico during the Mexican Revolution. John S. D. Eisenhower covers the same period in *Intervention: The United States and the Mexican Revolution, 1913-1917* (New York: W.W. Norton & Company, 1993.) More recently, Joseph A. Stout, Jr., *Border Conflict: Villistas, Carrancistas and the Punitive Expedition, 1915-1916* (Fort Worth: Texas Christian University Press, 1999), integrates considerable information on the Carrancista and Villista forces based upon research in primary sources in Mexico.

2. Stout, *Border Conflict*, pp. 2-7.

3. *Ibid*., pp. 8-17.

4. *Ibid*., pp. 17-32; Thomas and Allen, *The Mexican Punitive Expedition*, p. I-15.

5. Stout, *Border Conflict*, p. 37: Mason, *The Great Pursuit*, pp. 1-21;. The casualties at Columbus are variously reported. The official report of the 13th Cavalry stated that sixty-seven Mexican bodies were left at Columbus. Intelligence Section, HQ Punitive Expedition, "Narrative of the Punitive Expedition," September 1, 1916, Punitive Expedition File, AFAL. The figures may have been as high as one hundred. See Mitchell Yockelson, "The United States Armed Forces and the Mexican Punitive Expedition, Part 1," *Prologue* (Fall 1997), p. 256.

6. Mason, *The Great Pursuit*, pp. 65-70.

7. *Ibid.*, pp. 75-80, 84. The best biography of Pershing during the period is Donald Smythe, *Guerilla Warrior: The Early Life of John J. Pershing* (New York: Charles

Scribner's Sons, 1973).
8. Juliette A. Hennessy, *The United States Army Air Arm, April 1861 to April 1917*, New Imprint (Washington, D.C.: Office of Air Force History, 1985), pp. 42-45; Robert B. Casari, "The First 59," *Journal of the American Aviation Historical Society* (1st Quarter 1971), p. 5.
9. Quoted in Forrest C. Pogue, *George C. Marshall: Education of a General* (New York: The Viking Press, 1963), p. 114.
10. Hennessy, *The United States Army Air Arm,* p. 45.
11. Maurer Maurer, "The 1st Aero Squadron," *The Air Power Historian* (October 1957), p. 208; Casari, "The First 59," pp. 8-9.
12. Hennessy, *The United States Army Air Arm*, p. 146.
13. *Ibid.*; Ltr, Foulois to Reber, January 22, 1915, Ltr, Foulois to Reber, May 3, 1915, Ltr, Reber to Foulois, May 10, 1915, File Personal Correspondence, 1914-1915, Box 35, Foulois Papers, LC.
14. Telegram, Cowan to Signal Corps Office, January 8, 1915, File SCAS-1, Box 34, Foulois Papers, LC; Casari, "The First 59," pp. 12-13, 16; Benjamin D. Foulois, *From the Wright Brothers to the Astronauts: The Memoirs of Major General Benjamin D. Foulois*, with Col. C. V. Glines (New York: McGraw-Hill Book Company, 1968), pp. 115-16.
15. Hennessy, *The United States Army Air Arm*, pp. 135-36; Peter M. Bowers, *Curtiss Aircraft, 1907-1947* (Annapolis, Md: Naval Institute Press, 1979), pp. 34-35, 61-66; Robert B. Casari, *U.S. Army Aviation Serial Numbers and Orders, 1908-1923, Reconstructed* (Chillicothe, Oh.: Military Aircraft Publications, 1995), p. 9.
16. Ltr, Carberry to Cowan, July 26, 1915, File SCAS 1, Box 34, Foulois Papers, LC.
17. *Ibid*.
18. Hennessy, *The United States Army Air Arm, April 1861 to April 1917*, p. 135.
19. Foulois, *From the Wright Brothers to the Astronauts*, p. 119.
20. Miscellaneous Correspondence, File SCAS, Box 34, Foulois Paper, LC.
21. Diary, "Foulois," File 1st Aero Squadron, Personal, 1914-1915, Box 2, Foulois Papers, LC; Ltr, Foulois to Reber, October 4, 1915, File Personal Correspondence, First Aero Squadron, 1914-1915, Box 35, Foulois Papers, LC; Ltr, Reber to Foulois, February 2, 1915; Ltr, Foulois to Reber, March 23, 1915, File Personal Correspondence, 1914-1915, Box 35, Foulois Papers, LC; Ltr, Foulois to Scriven, April 7, 1915, File Personal Correspondence, 1915, Box 35, Foulois Papers, LC; Hennessy, *The United States Army Air Arm*, p. 149.
22. Telegram, McLain to Cmd. Off., SCAS, June 26 1915, File 2, Box 34; Ltr, Foulois to Cowan, August 18, 1915, File Personal Correspondence, 1915, Box 35, Foulois Papers, LC; Hennessy, *The United States Army Air Arm*, p. 146.
23. Ltr, Foulois to Reber, August 21, 1915, File Personal Correspondence, 1914-1915, Box 35, Foulois Papers, LC; Hennessy, *The United States Army Air Arm*, p. 147.
24. Ltr, Foulois to Cowan, August 18, 1915; Ltr, Foulois to Cowan, September 16, 1915, File Personal Correspondence, 1915, Box 35, Foulois Papers, LC; Hennessy, *The United States Army Air Arm*, p. 147.
25. Ltr, Foulois to Cowan, August 18, 1915, File Personal Correspondence, 1915,

Box 35, Foulois Papers, LC.
26. Ltr, Foulois to Cowan, September 6, 1915, *ibid*.
27. Ltr, Foulois to Cowan, September 16, 1915, *ibid*.
28. *Ibid.*; Ltr, Foulois to Cowan, September 19, 1915, *ibid*.
29. Hennessy, *The United States Army Air Arm*, p. 147.
30. Ltr, Foulois to Cowan, September 19, 1915, File Personal Correspondence, 1915, Box 35, Foulois Papers, LC.
31. Memo, H.C. Richardson, U.S. Navy Yard, to Reber, August 23, 1915, File #2369408, Box 8102, RG 94, NA; Foulois, *From the Wright Brothers to the Astronauts*, pp. 120-21; Hennessy, *The United States Army Air Arm*, p. 147.
32. Hennessy, *The United States Army Air Arm, April 1861*, pp. 147-48.
33. Quoted in *ibid.*, p. 148.
34. Ltr, Lt. B. Q. Jones to Cmd. Off., U.S. Troops at Brownsville, subj: Report on Aeroplane Accident of September 5th, and on the Aeroplanes in Use by this Detachment, September 7, 1915, File SCAS 1-3, Box 34, Foulois Papers, LC.
35. Ltr, Reber to Foulois, September 20, 1915, *ibid*.
36. Ltr, Foulois to Cowan, October 3, 1915, File Personal Correspondence, 1915, Box 35, *ibid*.; Bowers, *Curtiss Aircraft*, pp. 50-51; Hennessy, *The United States Army Air Arm*, p. 149; Casari, "The First 59," p. 16.
37. Ltr, Foulois to Cowan, October 3, 1915, File Personal Correspondence, 1915, Box 35, Foulois Papers, LC.
38. Ltr, Foulois to Reber, June 25, 1915; Ltr, Foulois to Reber, October 25, 1915, *ibid*.
39. Hennessy, *The United States Army Air Arm*, pp. 149-50.
40. Ltr, Foulois to Cowan, December 31, 1915, File Personal Correspondence, 1915, Box 35, Foulois Papers, LC.
41. Ltr, Foulois to Reber, December 6, 1915, *ibid*.
42. Ltr, Foulois to Reber, December 19, 1915, *ibid*; Foulois, 1st Indorsement, May 18, 1916, to Memo, Gorrell, subj: Estimate of Funds, May 17, 1916, File PUNEXP 6, Box 34, Foulois Papers, LC.
43. Ltr, Foulois to Cowan, December 31, 1915, File Personal Correspondence, 1915, Box 35, Foulois Papers, LC; Foulois 3rd Indorsement, January 26, 1916, to Ltr, Adj. Gen., U.S. Army, to Cmd. Gen. Southern Dept., subj: Co-operation Between Aero Service and Field Artillery, January 17, 1916, File PUNEXP-1, Box 34, Foulois Papers, LC; Foulois, 1st Indorsement, May 18, 1916, to Memo, Gorrell, subj: Estimate of Funds, May 17, 1916, File PUNEXP 6, Box 34, Foulois Papers, LC.
44. Foulois, 9th Indorsement, March 10, 1916, to Ltr, Adj. Gen., U.S. Army, to Cmd. Gen. Southern Dept., subj: Co-operation Between Aero Service and Field Artillery, January 17, 1916, File PUNEXP-1, Box 34, Foulois Papers, LC.
45. Memo, Maj. Gen. Tasker Bliss, Asst. C. of S., to Adj. Gen., March 10, 1916; Memo, Secretary of War Newton Baker to C. of S., March 10, 1916; Memo, Maj. Gen. Scott, to Adj. Gen., March 10, 1916; Memo, Lt. Col. Reber to C.S.O, March 10, 1916, File #2377632, Box 8127, RG 94, NA.
46. Telegram, #996, Maj. Gen. Funston to Adj. Gen., March 11, 1916, File

#2377632, *ibid*.; Maurer, *The U.S. Air Service in World War I*, II, p. 57.
47. Telegram, Scriven to Foulois, March 12, 1916, File PUNEXP 6-2, Box 35 Foulois Papers, LC; Telegram, Capt. Foulois to C.S.O., March 16, 1916, File #2381035; Telegram, Gen. Scriven to Adj. Gen., March 14, 1916, File #2378901; Telegram, Gen. Scriven to Adj. Gen., March 12, 1916, File #2378545, Box 8127, RG 94, NA; First Aero Squadron, Signal Corps, War Diary, Period March 12 to April 23, 1916, entry for March 18-19, 1916, File 5, Box 8, Benjamin D. Foulois Papers, MS 17, Air Force Academy Library. Hereafter cited as War Diary, Foulois Papers, AFAL. This document is also located in File 1914-1916, Box 2, Foulois Papers, LC.
48. Col. Edgar S. Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," *U.S. Air Services* (October 1932), p. 24
49. Telegram, Gen. Funston to Adj. Gen., March 13, 1916, File #2378823, Box 8128, Record Group (RG) 94, National Archives (NA); War Diary, March 13, 1916, Foulois Papers, AFAL. See also, Log of the First Aero Squadron for Week Ending March 18, 1916, File #2387753, Box 3131, RG 94, NA; Calvin W. Hines, "First Aero Squadron in Mexico," *Journal of the American Aviation Historical Society* (Fall 1965), p. 191.
50. Thomas and Allen, *The Mexican Punitive Expedition*, pp. II-11 - II-12. Mason, *The Great Pursuit*, pp. 85-89; Col. Samuel D. Dallam, "The Punitive Expedition of 1916," *The Cavalry Journal* (July 1927), p. 385. Dallam was commander of E Troop, 7th Cavalry, at the time.
51. War Diary, March 15, 1916, Foulois Papers, AFAL; Log of the First Aero Squadron for Week Ending March 18, 1916, File #2387753, Box 3131, RG 94, NA. .
52. Foulois, *From the Wright Brothers to the Astronauts*, p. 126.
53. The story of the1st Aero Squadron's impact on Pershing's motor transport is detailed in Roger G. Miller, "Wings and Wheels: The 1st Aero Squadron, Truck Transport, and the Punitive Expedition of 1916," *Air Power History* (Winter 1995), pp. 14-29.
54. Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," p. 25
55. War Diary, March 18, Foulois Papers, AFAL; Log of the First Aero Squadron for Week Ending March 18, 1916, File #2387753, Box 3131, RG 94, NA.
56. War Diary, March 18-19, 1916, Foulois Papers, AFAL; Log of the First Aero Squadron for Week Ending March 18, 1916, File #2387753, Box 3131, RG 94, NA; Telegram, #1113, Gen. Funston to Adj. Gen., March 22, 1916, File #2379210, Box 8128, RG 94, NA; Diary, Mexico (1916), 1st Aero Squadron, Box 2, Foulois Papers, LC; Report of Operations, Jones Collection, AFHRA.
57. War Diary, March 19, 1916, Foulois Papers, AFAL; Report of Operations, Jones Collection, AFHRA; Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," p. 26; Frank B. Elser, "Logs Kept by Aviators," *The New York Times*, April 9, 1916.
58. Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," p. 25.
59. War Diary, March 19, 1916, Foulois Papers, AFAL.
60. War Diary, March 20, 1916, *ibid*.

61. Foulois, *From the Wright Brothers to the Astronauts*, pp. 127-28; Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," p. 26.
62. War Diary, March 20, 1916, Foulois Papers, AFAL; Report of Operations, Jones Collection, AFHRA.
63. Foulois, *From the Wright Brothers to the Astronauts*, p. 128.
64. Telegram, #1109, Gen. Funston to Adj. Gen., March 21, 1916, File #2379210, Box 8128, RG 94, NA.
65. War Diary, March 22, 1916, Foulois Papers, AFAL.
66. War Diary, March 21, 1916, *ibid*.; Col. Samuel D. Dallam, "The Punitive Expedition of 1916," *The Cavalry Journal* (July 1927), pp. 387, 396.
67. War Diary, March 21, 1916, Foulois Papers, AFAL.
68. War Diary, March 22, 1916, *ibid*.; Report of Operations, Jones Collection, AFHRA; War Diary,
69. War Diary, March 22, 1916, Foulois Papers, AFAL; Report of Operations, Jones Collection, AFHRA.
70. *Ibid*..
71. Memo, Foulois to Cmd. Gen., Punitive Expedition, March 22, 1916, in War Diary, p. 5, 1916, Foulois Papers, AFAL.
72. Memo, Foulois to Cmd. Gen., Punitive Expedition, March 22, 1916, in War Diary, pp. 5-6, *ibid*.
73. War Diary, March 23-24, 1916, Foulois Papers, AFAL.
74. Foulois, *From the Wright Brothers to the Astronauts*, p. 129 fn.
75. War Diary, March 23-24, 1916, Foulois Papers, AFAL.
76. Rpt, Maj. Walter L. Clark to Cmd Off., Punitive Expedition, subj: Final Report of Operations of the Signal Corps Troops With the Punitive Expedition, February 6, 1917, AGO 370.22 Mexican Punitive Expedition Reports, Box 2020, RG 94, NA; War Diary, March 23-24, 1916, Foulois Papers, AFAL.
77. Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," p. 27.
78. *Ibid*., pp. 26-30; War Diary, March 23, 1916, Foulois Papers, AFAL.
79. War Diary, March 25, 1916, Foulois Papers, AFAL.
80. Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," p. 30; War Diary, March 26, 1916, Foulois Papers, AFAL.
81. Mason, *The Great Pursuit*, pp. 95-96.
82. *Ibid*., pp. 96-97; Art, "The Fight at San Geronimo," *Aerial Age Weekly* (April 10, 1916), p. 116.
83. Mason, *The Great Pursuit*, pp. 97-99; Thomas and Allen, *The Mexican Punitive Expedition*, pp. III-8 - III-14; Dallam, "The Punitive Expedition of 1916," pp. 388-91.
84. War Diary, March 27-29, 1916, Foulois Papers, AFAL
85. *Ibid*., March 30, 1916, Foulois Papers, AFAL
86. Report of Operations, Jones Collection, AFHRA.
87. *Ibid*., March 31, 1916, Foulois Papers, AFAL
88. *Ibid*., April 1, 1916, Foulois Papers, AFAL
89. *Ibid*., April 2, 1916, Foulois Papers, AFAL
90. Mason, *The Great Pursuit*, pp. 122.

91. Report of Operations, Jones Collection, AFHRA; War Diary, April 3-5, 1916, Foulois Papers, AFAL
92. War Diary, April 6, 1916, Foulois Papers, AFAL.
93. Draft article, B. C. Utecht, "Handicapped by Officials Here, Aviators in Mexico Tell World," April 1, 1916, File #2387672, Box 3131, RG 94, NA.
94. Correspondence and endorsements in *ibid*.
95. War Diary, April 7, 1916, Foulois Papers, AFAL.
96. *Ibid*.,
97. *Ibid*.; Foulois, *From the Wright Brothers to the Astronauts*, pp. 129-32.
98. War Diary, April 8, 1916, Foulois Papers, AFAL; Mason, *The Great Pursuit*, p. 129-30.
99. War Diary, April 10, 1916, Foulois Papers, AFAL; Mason, *The Great Pursuit*, pp. 130-31.
100. War Diary, April 11, 1916, Foulois Papers, AFAL.
101. Report of Operations, Jones Collection, AFHRA.
102. War Diary, April 12, 1916, Foulois Papers, AFAL.
103. Thomas and Allen, *The Mexican Punitive Expedition*, pp. IV-3 - IV-5; Mason, *The Great Pursuit*, pp. 132-38.
104. War Diary, April 13, 1916, Foulois Papers, AFAL.
105. Frank B. Elser, "Pershing Halts: Never Was Aided by the Mexicans," *New York Times*, April 21, 1916; Mason, *The Great Pursuit*, pp. 140-41.
106. Report of Operations, Jones Collection, AFHRA; War Diary, April 14, 1916, Foulois Papers, AFAL.
107. Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," p. 30.
108. War Diary, April 14, 1916, Foulois Papers, AFAL.
109. Report of Operations, Jones Collection, AFHRA; War Diary, April 14, 1916, Foulois Papers, AFAL.
110. War Diary, April 15-16, 1916, Foulois Papers, AFAL.
111. Mason, *The Great Pursuit*, p. 141.
112. War Diary, April 17-18, 1916, Foulois Papers, AFAL.
113. *Ibid*., April 19, 1916, Foulois Papers, AFAL; Mason, *The Great Pursuit*, pp. 145-46.
114. Report of Operations, Jones Collection, AFHRA; War Diary, April 19-22, 1916, Foulois Papers, AFAL.
115. Mason, *The Great Pursuit*, pp. 147-48.
116. *Ibid*., p. 159; Frank B. Elser, "Pershing Now Uses Philippines Tactics," *The New York Times*, May 13, 1916.
117. Memo, Maj. Gen Scott to Adj. Gen., March 23, 1916, File #2379210; Telegram, #1121, Gen. Funston to Adj. Gen., March 23, 1916, File #2379210, Box 8128, RG 94, NA.
118. Report of Operations, Jones Collection, AFHRA.
119. Report of the Chief Signal Officer, *War Department Annual Reports, 1916*, pp. 882, 884-85.
120. Proceedings of a Board of Officers Convened at Columbus, New Mexico, Pursuant to the Following Order: Squadron Orders No. 20, April 29, 1916, and Ltr,

Foulois to Comd. Gen., Punitive Expedition, subj: Unsuitable Aeroplanes for Field Service, May 9, 1916, in File PUNEXP 6-1-2, Box 34, Foulois Papers, LC; War Diary, April 23, 1916, Foulois Papers, AFAL; Report of Operations, Jones Collection, AFHRA; Peter M. Bowers, *Curtiss Aircraft, 1907-1947* (Annapolis, Md: Naval Institute Press, 1979), pp. 111-12.
121. Report of Operations, Jones Collection, AFHRA.
122. Peter M. Bowers, *Curtiss Aircraft, 1907-1947* (Annapolis, Md: Naval Institute Press, 1979), pp. 122, 130-31.
123. Exhibit A, attached to Report of Operations, Jones Collection, AFHRA
124. Memo, Lt. Gorrell to C.S.O., subj: Estimate of Funds, May 17, 1916, File PUNEXP 6; Ltr, Capt. Foulois to Cmd Officer, Base of Communications, Columbus, N.M., July 9, 1916, File PUNEXP 2, Box 34, Foulois Papers, LC.
125. Report of Operations, Jones Collection, AFHRA; Ltr, Capt. Foulois to Cmd. Off., Base of Communications, July 9, 1916, File PUNEXP 6-2, Box 34, Foulois Papers, LC; Telegram, Capt. Foulois to Cmd. Gen., Punitive Expedition, June 19, 1916, File PUNEXP 6-1-1, Box 34, Foulois Papers, LC.
126. Report of Operations, Jones Collection, AFHRA; Memo, Capt. Foulois to Cmd. Off., Base of Communications, July 22, 1916, File PUNEXP 6-2, Box 34, Foulois Papers, LC.
127. Ltr, Capt. Foulois to Cmd. Off., Base of Communications, July 9, 1916, File PUNEXP 6-2, Box 34, Foulois Papers, LC.
128. Ltr, Lt Dargue to Capt. Foulois, May 21, 1916, File Personal Correspondence (1st Aero), Box 35, Foulois Papers, LC.
129. Report of Operations, Jones Collection, AFHRA; Col. Edgar S. Gorrell, "Why Riding Boots Sometimes Irritate an Aviator's Feet," *U.S. Air Services* (October 1932), pp. 24-25.
130. Frank C. Page, "Building Up the Aviation Service," *The New York Times*, August 30, 1916.
131. Report of Operations, Jones Collection, AFHRA; Msg, Capt. Foulois to Chief Signal Officer, June 21, 1916, File PUNEXP 6-1, Box 34, Foulois Papers, LC.
132. Report of Operations, Jones Collection, AFHRA.
133. Telegram, Captain Foulois to C.S.O., August 8, 1916, File PUNEXP 6-1, Box 34, Foulois Papers, LC.
134. Memo, Capt. Foulois to Cmd. Off., Base of Communications, August 10, 1916, File PUNEXP 6-2, Box 34, Foulois Papers, LC; "Pershing's Troops Now Out of Mexico," *The New York Times*, February 6, 1917.
135. Ltr, Brig. Gen. Scriven to Maj. Clark, subj: Expenditures of 1st Aero Squadron, May 12, 1916, File PUNEXP-6, Box 34, Foulois Papers, LC.
136. Foulois, 3rd Indorsement, May 20, 1916, to *ibid*.
137. Foulois, *From the Wright Brothers to the Astronauts*, pp. 125, 141
138. "Statement of Casualties among Villistas Who Participated in the Attack on Columbus, New Mexico," March 9, 1916, Appendix to Rpt, HQ Punitive Expedition, subj: Operations of "General" Francisco Villa Since November, 1915, dtd.: July 31, 1916, Box 8, SMS 677, J. Edmund Lorenzo papers, AFAL; Mason, *The Great Pursuit*, pp. 65-70.

139. Maurer Maurer, *Aviation in the U.S. Army, 1919-1939* (Washington, D.C.: Office of Air Force History, 1987) pp. 99-100.
140. "Tells Why Wilson Selected Pershing," *The New York Times*, September 5, 1924.
141. Thomas and Allen, *The Mexican Punitive Expedition*, Appendix D, p. A-19.
142. *Ibid*.
143. Foulois, *From the Wright Brothers to the Astronauts*, p. 136.
144. John H. Morrow, Jr., *The great War in the Air: Military Aviation from 1909 to 1921* (Washington, D.C.: Smithsonian Institution Press, 1993), pp. 63, 69, 131-96.
145. *Ibid*., pp. 265-267; Casari, *U.S. Army Aviation Serial Numbers and Orders, 1908-1923*, pp. 7-11.
146. Ltr, Harms to Gorrell, May 12, 1916, File Personal Correspondence (1st Aero), Box 35, Foulois Papers, LC.