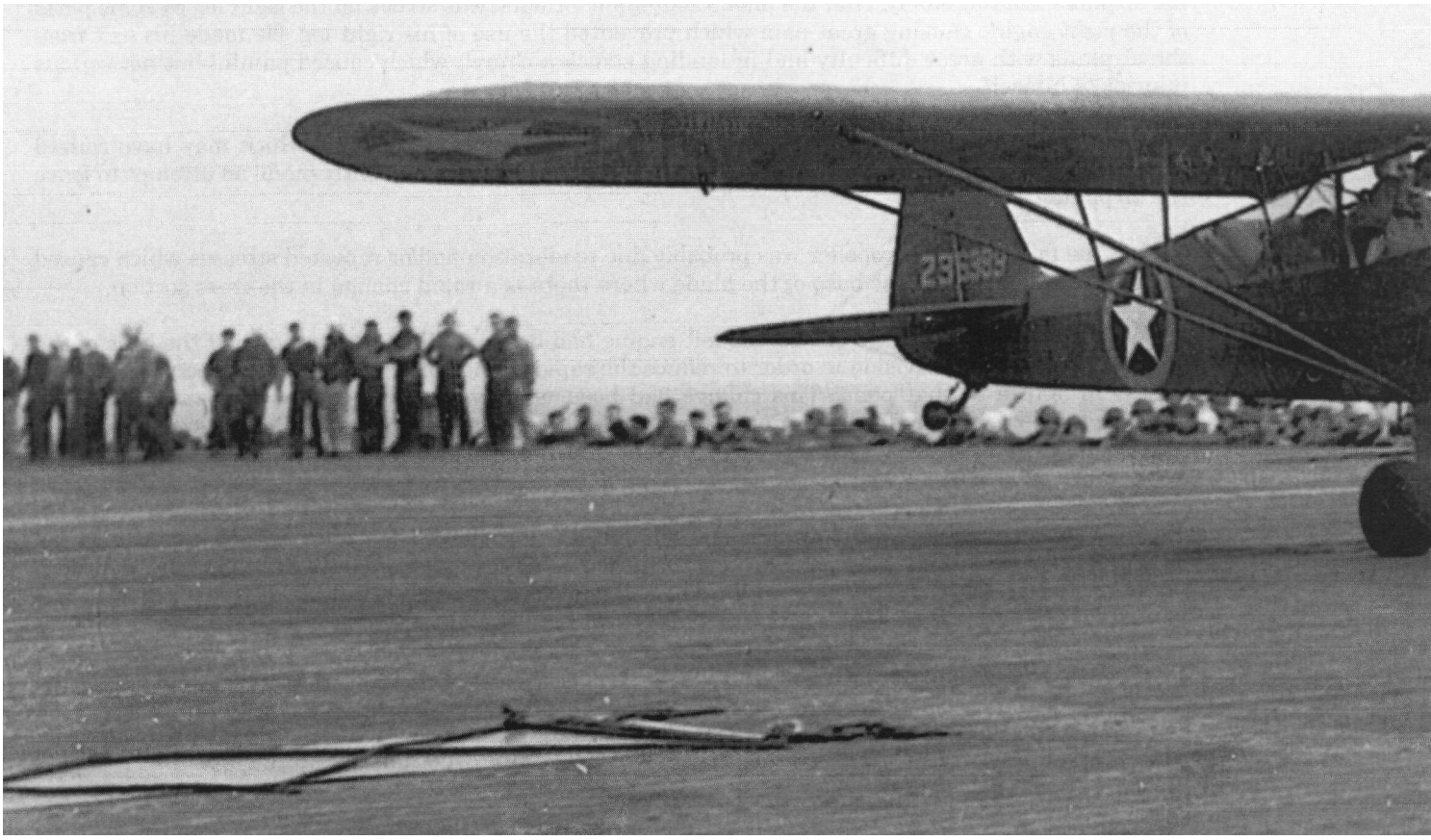
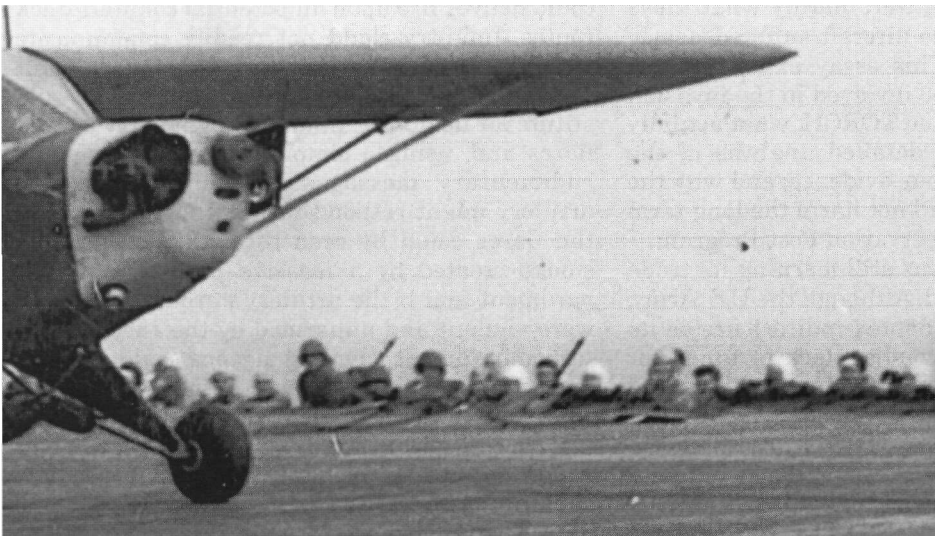
Disaster off Casablanca: Air Observation Posts in Operation Torch and the Role of Failure in Institutional Innovation





Edgar Frank Raines, Jr.

(Overleaf) The L–4 of 2d. Lt. William H. Butler and Capt. Breton A. Devol, Jr., starts its takeoff roll down the flight deck of the USS *Ranger on* November 9, 1942. *(National Archives)*

A new kind of military aviation made its combat debut off Casablanca, French Morocco, on the afternoon of November 9, 1942. The new organization consisted of light aircraft flown and maintained by officers and men of the U.S. Army Field Artillery. Known officially as air observation posts (as distinguished from the Artillery's familiar ground observation posts), they were organized into air sections consisting of two aircraft, two pilots, one mechanic, one driver, and one driver's assistant. Theoretically, each firing battalion of Field Artillery, each separate artillery brigade or group headquarters, and each division artillery headquarters included one air section. But the program was so new that in the American contingent of the North African invasion force, some 5 1/3 divisions, only three field artillery aircraft belonging to the 3d Infantry Division Artillery were available to support the landings. The three L–4s—civilians would have recognized them as Piper Cubs—took off from the USS *Ranger* and headed for shore to support the division's drive on Casablanca. With them they carried the hopes of a generation of Field Artillery reformers.[1]

ON NOVEMBER 9, 1942 THREE L-4S TOOK OFF FROM THE USS RANGER AND HEADED FOR SHORE TO SUPPORT THE DIVISION'S DRIVE ON CASA-BLANCA

The results, however, were hardly what these officers anticipated—the aircraft suffered nearly an absolute disaster. This essay examines how these aircraft came to be involved in the invasion of North Africa, Operation TORCH; what actually happened, including a detailed analysis of the conflicting and ambiguous evidence; and why the action off Casablanca did not harm the long-term prospects of the Air Observation Post Program.

The Field Artillery was still learning its trade when World War I ended. Although the U.S. Army, as early as 1905, had adopted indirect fire as its standard doctrine for combat, lack of funds for training kept mastery of technique low and restricted to a small circle of officers. The hurried, often chaotic, mobilization of 1917 produced officers only partially trained in basic techniques. American Army officers scrambled to assimilate the lessons their allies had derived from the vast siege-like conditions on the Western Front. Some individual formations achieved a high level of proficiency, but overall the American artillery was the least technically competent of the major powers at the time of the Armistice.[2]

THE AMERICAN GUNNERS' GREATEST DEFICIENCY LAY IN THEIR INABILITY TO COORDINATE THEIR FIRE WITH INFANTRY IN THE ATTACK

The American gunners' greatest deficiency lay in their inability to coordinate their fire with infantry in the attack. British and German artillery led the way in pioneering techniques of map fire involving preregistration of batteries using geographic features of known location, phase lines, and creeping barrages. By 1918, the most sophisticated artillerymen could dispense with registration fire by combining knowledge of the wear on individual gun tubes, information about the manufacturing properties of shell lots, and the measurement of key meteorological factors, such as temperature, wind speed and direction, and atmospheric pressure to accurately predict the trajectory of individual rounds. Dispensing with registration conferred great advantages. Batteries did not have to reveal their location and prematurely expose themselves to counterbattery fire. Equally important, batteries could suddenly bring fire upon a target without warning. Both techniques relied upon detailed and highly accurate maps. Creation of those maps depended upon aerial photography. In the artillery system of 1918 this was the most important mission performed by observation aircraft.[3]

Map fire as the primary method of fire support required detailed planning. Artillery officers had to be aware of every fold of ground so that they could deliver fire upon all potential counterattack routes. Infantry could not readily communicate with its supporting artillery once an assault jumped off—so meticulous planning had to substitute for flexibility. Infantry might carry colored flares and, using a simple code, convey equally rudimentary messages to the artillery. The artillery might respond in the desired fashion if the flares could be seen through the dust and smoke created by a massive preliminary bombardment and if the artillery's ground observers were vigilant and unharmed by the enemy counterbombardment. Homing pigeons could at times succeed in carrying messages to the rear. But this conveyance worked best if the infantry was not too closely engaged, the circumstance when it would be most in need of fire support. Soldiers could lay wire as they advanced, but it was usually cut by enemy artillery fire. Forward elements could send back runners, but this was slow because the messengers had to make their way to the rear through terrain already churned by shells. They were frequently retarded by enemy and friendly defenses and often subjected to still dangerous enemy fire. Observation aircraft, almost always two-place in this war with a pilot and observer, often flew contact missions, which

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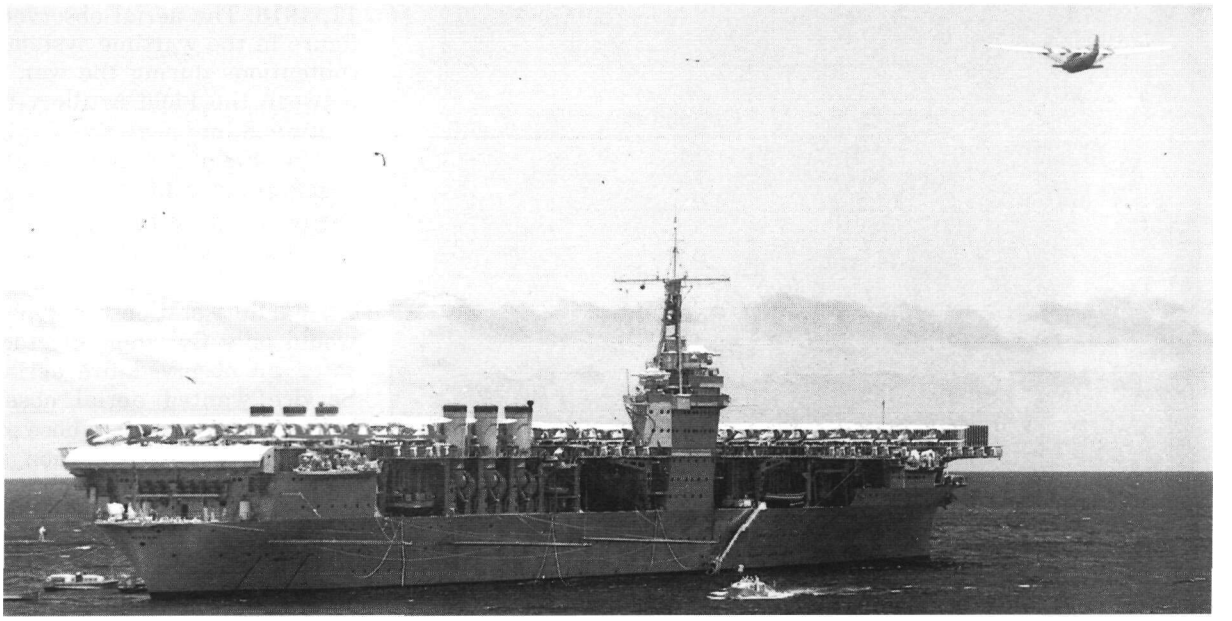


A clipper flies over the USS *Ranger* (CV–4) off Honolulu, Hawaiian Territory, on May 8, 1937. *(National Archives)*

AMERICAN OBSERVATION AIRCRAFT WERE EQUIPPED, UNTIL THE END OF THE WAR, WITH ONE-WAY SPARK GAP RADIOS

involved simply monitoring the location of friendly troops and reporting their position back to higher headquarters.[4]

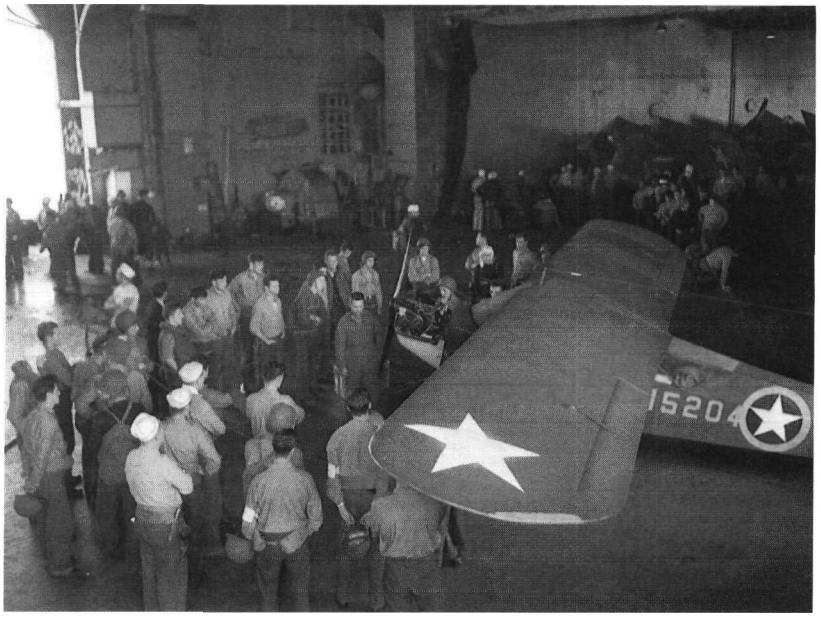
To be effective, an aerial observer had to be able to orient himself over a blasted, shell-pocked landscape. He also had to be knowledgeable about ground operations in general and the specific attack plan so that he could understand what he was seeing. He also required a radio. American observation aircraft were equipped, until the end of the war, with one-way spark gap radios. They transmitted in Morse Code—essentially sending bursts of static against a background of static generated by the spark plugs of the imperfectly shielded internal combustion engines that powered the aircraft.[5]

Radio was not an option for infantry in the attack. The military radios of 1918 were large, fragile, and very heavy. The standard Army radio, when the American Expeditionary Forces arrived in France, weighed 500 pounds and was authorized at division headquarters and above. By late 1918, the U.S. Army Signal Corps had procured fifty-pound radios that were assigned down to battalion level. They were not rugged enough, however, to go forward with the troops.[6]

BATTERY COMMANDERS HAD TO REQUEST THE SERVICES OF SUCH AN AIRCRAFT IN ADVANCE

These communications problems were at the heart of the difficulties faced by the Field Artillery of all the warring powers in attempting to deliver indirect observed fire in support of infantry attacks. By 1918, a line of observation balloons paralleled the front, just out of enemy artillery range. Balloon observers provided one of the major safeguards on the operational level against surprise attack and gave some insurance at the tactical level as well. In the defense balloon observers, connected to the ground by telephone, could direct fire. In the attack, however, friendly troops quickly passed from their observation, obscured by terrain features and the dust and cordite smoke associated with artillery bombardments. Even when the attacking troops remained in sight, the observer's oblique angle of vision to a target at long range made accurate fire difficult. Aerial observers in fixed-wing aircraft could fly directly over a target, mitigating the problems facing balloon observers. Like balloons, fixed-wing observation aircraft blanketed the front. Each flew a regular beat over a particular sector. Individual observers became so familiar with the enemy position that they could detect even minute changes in enemy trenches. These "beat" aircraft could not observe fire except in the most unusual of situations. In an emergency they might fire a flare meaning "fire on my position." The Allied armies maintained observation posts all along the front where soldiers scanned the sky waiting for such a flare to fall. Accurate fire depended upon someone seeing the flare the moment it was fired, accurately noting the position of the aircraft relative to the ground, and forwarding that information immediately to a firing battery. Given the vagaries of the human attention span, the system was hardly foolproof.[7]

The unit of fire in World War I was the battery. Accurate delivery of fire depended upon a battery of known location and an observer of known location. Because there were many more batteries than observation aircraft available to direct fire, battery commanders had to request the services of such an aircraft in advance of the mission—normally twenty-four hours. A battery commander, usually a captain, most frequently in or attached to a field artillery brigade organic to a division, had to contact through channels a major and squadron commander usually attached at the next higher echelon of command, the corps. The coordination was by telephone, susceptible to being interrupted by shell fire or a higher priority call—in practice a call made by anyone with more rank than a captain. Even if the shoot was arranged, the aircraft might be diverted to a higher priority mission by a higher headquarters.[8]



Aviation Machinist Mates on the hangar deck of the USS *Ranger* watch Capt. Ford E. Allcorn give a final check to the Continental A-65 engine of his L-4 just before taking off on November 9, 1942. *(National Archives)*

If the aircraft did fly the mission, the pilot first had to find the firing battery from the air, often a time consuming and not always successful task, orient himself, and then locate the target. Once successful, the observer had to radio adjustments in Morse Code back to a headquarters equipped with a radio, which would pass them by wire to the battery commander, who actually directed fire. In a successful attack, batteries often had to displace forward, forcing them to depend on telephone lines laid across the surface of the ground rather than the buried cables normally relied upon. The easily disrupted wires meant that observed fire was more likely to succeed at the opening of an offensive rather than toward its end.[9]

THE AERIAL OBSERVER WAS CLEARLY A KEY FIGURE IN THE WARTIME SYSTEM

Clearly during World War I, aerial observed fire in real time was a tool available to battery commanders only under very special circumstances. The system was rigid and not readily adaptable to the shifting circumstances of ground combat. Aerial observed fire was most useful against fixed strong points in the enemy's defensive system during the initial phases of an attack or after an attack had become hung up and the command was trying to get it restarted. From the top down—and this was the Air Service point of view—it looked like a rational allocation of scarce resources for a useful but ancillary mission. From the bottom up—the Field Artillery's perspective—the system represented equal parts of bureaucratic obscurantism and blind chance that produced frustration, anger, and limited success. The best thing to say for the system was that occasionally it worked as designed.[10]

The American Field Artillery came out of the Great War convinced that it had to do better in the next conflict and focused on the infantry-artillery coordination problem. (The interwar term was "liaison.") The Field Artillery was the first combat arm to launch a formal "lessons learned" review of its experience after November 11, 1918. The aerial observer was clearly a key figure in the wartime system. His role had been contentious during the war, and disagreements between the Field Artillery and the Air Service continued into peacetime.[11]

The Field Artillery position was that the observer should be a knowledgeable Field Artillery officer, familiar with ground maneuver and thus able to better understand what he was seeing. In the Field Artillery view, the observer's normal duty station would be a firing battery. He would only fly when the tactical situation dictated an observed fire aerial mission. The Air Service wanted aerial observers to be rated Signal Corps officers, whose primary duty station would be with observation squadrons. (During World War I all officers in the Air Service actually held commissions in the Signal Corps even though the Signal Corps lost control of the U.S. military aviation program in March 1918.)[12]

The wartime expedient was to commission would-be aerial observers in the Field Artillery, train them as such, and then send them to aerial observer school. When they graduated, the War Department transferred them from the Field Artillery to the Signal Corps. Neither the Field Artillery nor the Air Service was satisfied with this arrangement. The Field Artillery wanted the aerial observers to remain in the Field Artillery throughout their service. The wartime observers, in the view of experienced Field Artillery officers, had only a superficial understanding of the branch and how it operated. The Air Service complained that many of the aerial observers did not want to transfer to the Signal Corps, and that many lacked "the enthusiasm" required to successfully complete combat missions. The American Expeditionary Forces Artillery Board, usually known as the Hero Board after its president, Brig. Gen. Andrew Hero, Jr., advocated the Field Artillery solution to the observer question. But both the American Expeditionary Forces Superior Board, also referred to as the Dickman Board after its president, Maj. Gen. Joseph T. Dickman, and the War Department favored the Air Service approach. The Air Service (and later the Air Corps) centralized observer training during the interwar period at Brooks Field, Texas.[13]

The Field Artillery received very little research and development funding between 1919 and the late 1930s. It focused upon improving infantry-artillery liaison with the materials at hand. At first this simply meant perfecting mastery of the most advanced wartime artillery techniques and then spreading this level of training throughout the force. Only in the late 1920s did the Field Artillery begin to go beyond the World War I system. Successive chiefs of Field Artillery encouraged experimentation by junior officers at Fort Sill, Oklahoma, that stretched over a decade and beyond. They replaced the battery with the battalion as the standard unit of fire. A fire direction center superseded the overworked battery commander as the mechanism for orchestrating

and concentrating fire. Whereas in World War I a single battery could concentrate its guns on a target using observed fire, by the early 1940s the Field Artillery School had developed a procedure for quickly massing the fire of an entire division (and later corps) of artillery upon a single target. In a demonstration of divisional artillery at Fort Sill in September 1941, gunners achieved this concentration in a few minutes. In contrast during the invasion of Syria in July 1941 the Royal Artillery had required an hour and fifteen minutes to concentrate the fire of a comparable number of guns.[14]

WHILE GROUND OBSERVERS WOULD USUALLY SUFFICE, THERE WERE CERTAIN SITUATIONS IN WHICH AN AERIAL OBSERVER WOULD BE A NECESSITY

The new artillery system was designed for a much faster tempo of operations than World War I, but it rested on the assumption that observed fire would be the primary mode of delivery and that American artillery would bring its guns to bear in real time, not the elapsed time of map fire. The new approach required that observers always be available to direct fire at any targets in range of the guns. While ground observers would usually suffice, there were certain situations in which an aerial observer would be a necessity—as when enemy artillery was in defilade. But the aerial observer would have to be immediately available to the artillery battalion commander.[15]

Advances in radio had revolutionized the role that aerial observers could now play in combat. Radio technology was one of the few areas of the military art where the U.S. had actually led its Allies during World War I. The Chief Signal Officer, Maj. Gen. George O. Squier, had a personal interest in both aviation and radio and had pushed the development of two-way voice radio for aircraft. He had demonstrated the new technology outside Paris shortly before the Armistice. Voice radio represented a vast improvement over the spark gap apparatus, but it was an immature technology in 1918 and featured significant drawbacks. The first generation of voice radios were amplitude modulated (AM), which meant that, like the spark gap radios, they picked up the electrical discharges from the spark plugs of the aircraft engines as static. Deciphering incoming messages out of a sea of static sometimes required all the attention an observer could muster. The radios were tuned by a dial and required constant adjustment to keep them on the assigned frequency. This meant that a substantial portion of the aerial observer's attention had to be focused inside the cockpit. With the spark gap radio he could focus outside the cockpit—looking for enemy pursuits and ground targets. Finally, voiceradio had only a very limited effective range.[16]

EARLY IN 1939, MAJ. GEN. ROBERT M. DANFORD, APPROACHED GENERAL ARNOLD ABOUT ATTACHING OBSERVATION AIRCRAFT DIRECTLY TO FIELD ARTILLERY BRIGADES

Unlike the Field Artillery, the Signal Corps received fairly substantial funding for research and development during the interwar period. By the late 1930s, it was in the process of introducing frequency modulated (FM) radios as standard. They were unaffected by the electrical impulses generated by aircraft engines. Push button tuning became standard for aircraft radios about the same time. Not only were they easier to use than the earlier generation of AM radios—and consequently the observer could redirect his attention outside the cockpit—but they had more power as well. The new generation of Signal Corps radios gave the aerial observer a flexibility that could only be dreamed of by his World War I counterparts. These advances immediately made the questions of what branch insignia the aerial observer would wear and the type of craft in which he would fly more contentious than at any time since 1918.[17]

Alone among the Army's combat arms, the Air Corps (the name for the Air Service after 1926) had received sufficient funds to progressively modernize after 1926. By the late 1930s it was completing its conversion to modern aircraft—monoplanes with internal bracing, stressed aluminum skin, cantilevered wings, retractable landing gear, and completely enclosed cockpits. Although after 1919 the Air Service/Air Corps concentrated first on the development and employment of pursuits and then bombers, observation aircraft benefitted from this design revolution as well. Air Corps officers, drawing upon experiences over the Western Front, consistently emphasized speed as the key factor to survivability in combat. The result was a generation of observation aircraft that were approximately 100 miles per hour faster than their World War I counterparts—and consequently almost too fast for effective visual observation. Unfortunately, because observation aircraft had to carry two crew members and heavy cameras, they were large, sluggish to maneuver, and slow compared to the latest pursuits-some 100 miles per hour slower. The Chief of the Air Corps in the late 1930s, Maj. Gen. Henry H. Arnold, feared that this performance differential would make observation aircraft peculiarly vulnerable to hostile aviation. At the same time the complexity and weight of the observation aircraft meant that they had to be based at well developed airfields far behind the lines, making them less attuned to the ground battle than their World War I counterparts.[18]

Early in 1939, the Chief of Field Artillery, Maj. Gen. Robert M. Danford, approached General Arnold about attaching observation aircraft directly to Field Artillery brigades. Arnold was not impressed with Danford's arguments and proposed to retain observation squadrons at corps level and above. He believed that the only solution to the vulnerability problem was a fast, twin-engine light bomber, a craft admirably suited for photo reconnaissance but not for visual observation. Danford had wanted the Air Corps to supply aircraft, pilots, and ground crew, but with Arnold's rebuff he decided to propose a solution entirely separate from the Air Corps. The Field Artillery would own, man, and maintain the craft. Bureaucratic conflict ensued. Not until December 10, 1941, did Danford receive approval to organize a flight detachment to test his con-

cept, and not until June 6, 1942, did the War Department formally approve the Air-Observation-Post Program. This meant that the Americans lagged considerably behind the British. The Royal Artillery and Royal Air Force had already organized a similar program in the Home Army. It had not yet spread to the forces deployed in the active theaters. Danford had used the British experiment to justify his own proposal and had also borrowed the British terminology. Like the British he chose light aircraft to equip his air sections. They were two-place aircraft with metal frames, fabric covering, and fixed landing gear with the performance characteristics comparable to World War I observation aircraft (the Piper L-4 had a maximum speed of 80 miles per hour), greater reliability, short landing and take-off runs, and sufficient ruggedness to operate out of forward air strips.[19]

MOST COMMANDERS HAD ADOPTED THE OLD STAFF OFFICER'S RULE OF "FEEDING THE ALLIGATORS NEAREST THEM."

The late start for the American program played havoc with hopes that air sections could support the early deployment of troops overseas. The Field Artillery Pilot Course, based largely upon the instruction the test detachment had received in January 1942, was initially designed to last seven weeks. It sought to take a competent light aircraft pilot and give him the skills he would need to fly tactically in combat. Only after the pilot joined his parent unit would he have the opportunity to gain more than a cursory experience in working with ground units. Conversely the artillery battalions would have to await the arrival of the aircraft, pilots, and ground crew before most battalion commanders realized that they had aircraft sections assigned. The rapid expansion of the Army had produced a blizzard of directives from Headquarters, Army Ground Forces, to say nothing of subordinate headquarters. Most commanders had adopted the old staff officer's rule of "feeding the alligators nearest them." They had received notice of the new air sections, but this was a problem they could safely ignore until the men and materiel actually arrived.[20]

One of the key staff officers at Headquarters, Army Ground Forces, in the fight for the Air Observation Post Program, Col. Thomas E. Lewis, made arrangements for mechanics and pilots from II Corps to receive training prior to the formal opening of pilot and mechanics courses on August 4. The II Corps was scheduled for early deployment to Great Britain as part of the buildup for a cross Channel attack, Operation BOLERO. The Director of the Department of Air Training, Col. William W. Ford, had calculated on the basis of his experience in the 1940 maneuvers that there were ample numbers of light plane pilots in the ground forces to fill the first four pilot classes. Thereafter, he expected to use the graduates of the Civilian Pilot Training Program-a pre-Pearl Harbor Civil Aviation Authority project to give basic flight training to college students and thereby increase the pool of men with aeronautical training. Unfortunately, since Ford had served with troops, the Army Air Forces (now a coordinate command with the Army Ground Forces) had siphoned off most aircraft pilots in the ground forces to serve as ferry pilots. The request for volunteers from II Corps consequently produced only three would-be pilots, and one, Capt. Ford E. Allcorn, did not complete the course. He was sent back to one of the regular courses. In contrast, a more than ample number of would-be aircraft mechanics volunteered.[21]

The difficulties extended into the regular courses. So few experienced pilots arrived for the first four classes that the Commandant of the Field Artillery School consolidated the first two classes into Class P-1 while the other two planned classes became P-2. Ford had anticipated that 30 pilots would report for each class and that 25 would graduate. By October 2, when P-2 students graduated, he had anticipated that the regular courses would have produced 100 pilots. He had 32. Not until December did the program reach the earlier goal. The graduates of the Civilian Pilot Training Program proved to be too poorly trained to show to good advantage in the tactical training in the Department of Air Training.[22]

In August, just as Ford was becoming aware of the full dimensions of the pilot matriculation problem, the G-3 of the Army, Maj. Gen. Idwal H. Edwards, an Air Corps officer who had formerly commanded Air Training Command, arrived at Fort Sill and accused Ford and the commandant of the School of deliberately contravening War Department directives and infringing upon Army Air Forces prerogatives in pilot training. This dispute was eventually resolved to everyone's satisfaction in December, but not before the commanding general of Army Ground Forces, Lt. Gen. Lesley J. McNair, and the assistant secretary of war, John J. McCloy, became involved. Thereafter, the Field Artillery supplied officers who volunteered to fly to the Army Air Forces for primary flight training. Graduates reported to Fort Sill for advanced flight training. The quantity—except for a brief period in 1944—and quality of air- observation-post student pilots caused little concern for the remainder of the war. But at the time of the landings in North Africa, Field Artillery pilot training at Fort Sill was still in flux and the number of graduates was much lower than anticipated.[23]

During the summer of 1942, as Ford and his associates struggled to get the Department of Air Training operating, American and British planners contended over the strategy to follow in the war against Germany in ways that had major ramifications for the fledgling program. Not until July 30 did President Franklin Delano Roosevelt unequivocally side with the British preference for landings in northwest Africa. The month of August was given over to debating various outline plans. Only on September 5 were three major landing sites agreed upon—Casablanca on the

An L-4 is brought up to the flight deck of the USS *Ranger an* an elevator on November 9, 1942. *(National Archives)*

Atlantic coast and Oran and Algiers on the Mediterranean shore. This left the Western Task Force, commanded by Maj. Gen. George S. Patton, Jr., using the headquarters staff of the I Armored Corps, with approximately one-and-one half months to plan and train for the Moroccan operations—a task that subsequent wartime experience revealed took at least five months. The situation confronting the II Corps headquarters which planned the Oran landings as Central Task Force was similar, further complicated by the fact that the corps commander, Maj. Gen. Mark W. Clark, was elevated to deputy Allied Force commander and was succeeded by Maj. Gen. Lloyd R. Fredendall just thirteen days before the first convoys left port. The Eastern Task Force's landings at Algiers, originally an all-British operation led by Lt. Gen. Kenneth A. N. Anderson, commander of the British First Army, became more complex when planners for political reasons inserted an American first wave, the Eastern Assault Force, headed by Maj. Gen. Charles W. Ryer. The War Department made Operation TORCH its top priority for men and materiel among its worldwide commitments.[24]

MOST OF THE PILOTS LACKED THE OPPORTUNITY EVEN TO EXAMINE THEIR AIRCRAFT...THE AIR SECTIONS COULD NOT TRAIN WITH THEIR BATTALIONS

The Operations Division of the War Department General Staff claimed all graduates of the Department of Air Training for assignment to units deploying to Great Britain or units in the United States designated to participate in the invasion of North Africa. After Ford had culled potential instructors from P-1, the remainder of the class, eight pilots, and eight graduates of the mechanics course plus one pilot and one mechanic from the original test group moved as casuals to the Port of New York in late September 1942, and sailed for Great Britain in charge of the senior officer, Capt. Joseph M. Watson, Jr. There, administrative confusion at the reception depot resulted in them being sent to the 34th Infantry Division in Northern Ireland as infantry replacements. Ford had sent his adjutant, the pilot member of the original test detachment—1st Lt. Delbert L. Bristol—to accompany the detachment. Wise in the ways of the Army, Ford had told Bristol that if anything untoward happened he should contact an old friend of his, Brig. Gen. Alfred M. Gruenther, who was the chief of staff of II Corps.[25]

After no little difficulty, Bristol obtained permission to go to London and saw not only Gruenther but also the corps commander, General Clark. Both Clark and his chief of corps artillery, Colonel Lewis, were very familiar with the Air Observation Post Program. The II Corps staff had, in fact, been searching for the aviators without success. Clark also knew that the Department of Air Training had fallen behind its scheduled production of pilots. With the II Corps facing imminent commitment to combat, he had decided to establish a local school to train Field Artillery pilots. This, of course, would handle the long range problem of securing pilots but not the short range difficulty of providing observed fire to support either the Central Task Force or the Eastern Assault Force. When Clark became deputy commander of the North African invasion force, his successor, General Fredendall, activated the school at Perlham Downs, Wilts, on November 21, 1942, two weeks after the landings. The pilots and mechanics from Fort Sill thus became the instant cadre for the II Corps Air Observation Post School, much to Bristol's dismay because he had hoped to fly in combat.[26]

While some graduates of P-2 reported to the II Corps, others joined units in the United States designated for the Western Task Force. The orders to join the 3d and 9th Infantry Divisions and the 2d Armored Division were much delayed, and these units had moved to their staging areas when the pilots and mechanics reported for duty. Consequently, most of the pilots lacked the opportunity even to examine their aircraft, that were packed in overseas crates for shipping, let alone demonstrate their technique or get to know the ground officers with whom they would be closely associated. The air sections could not train with their battalions, which also meant that the other members of those units had no appreciation of their capabilities or even that the sections were an integral part of the Field Artillery team.[27]

Lack of effective higher level command and staff oversight compounded the difficulties. The task force commander, General Patton, was familiar in general with the capabilities of light aircraft. He had used his own light plane extensively while commanding the 2d Armored Division during the 1941 Tennessee and Louisiana maneuvers. One member of the Field Artillery section in Patton's headquarters, Lt. Col. John W. Hansborough, was specifically detailed to handle light aircraft, but his role apparently focused on getting the aircraft and pilots aboard ship and ready to fly. Their mission would be to provide aerial observation for field artillery landed in the initial

A Navy Aviation Machinist's Mate aboard the USS *Ranger* cranks the engine of the L–4 flown by 2d. Lt. William H. Butler with Capt. Breton A. Devol, Jr., as an observer preparatory to takeoff on November 9, 1942. *(National Archives)*

stages of the operation. Not much thought, however, appears to have gone into what would happen once the aircraft were actually in the air.[28]

While the orders for the pilots were en route, Hansborough secured three early model L–4s, unfortunately in bad repair, and arranged for them to be transferred to the aircraft carrier USS *Ranger*. By the time four pilots assigned to the 3d Infantry Division—Capt. Ford E. Allcorn, Capt. Breton A. Devol, Jr., 1st Lt. John R. Shell, and 2d Lt. William H. Butler—arrived at Norfolk, Virginia, on October 19, the *Ranger* had already sailed. Hansborough secured passage for them aboard a destroyer, the USS *Dallas*, which sailed the next day. Four days later the pilots and 800 pounds of equipment transferred at sea to the *Ranger*. Assisted by naval personnel the four pilots spent virtually the entire voyage replacing and doping the fabric, tuning the engines, and installing standard Signal Corps radios.[29]

Force BRUSHWOOD, commanded by Maj. Gen. Jonathan W. Anderson and consisting of the 3d Infantry Division reinforced by elements of the 67th Armored Regiment, made the main ground attack against Casablanca. The division began landing at the small port of Fedala, located on a partially sheltered bay eighteen miles northeast of Casablanca, before dawn on November 8. Elements of the French Navy, a light cruiser and several destroyers, sortied with the intent of destroying the transports in Fedala Bay. This brought on an old fashioned gun battle with Task Group 34.1, built around the battleship USS *Massachusetts*, and the Fire Support Group of Task Group 34.9, the cruisers directly supporting the landing at Fedala. While the gun battle raged inshore, Task Group 34.2, the Air Group consisting of the *Ranger* and the escort carrier U.S.S. *Suwanee* plus a destroyer screen, launched sorties from well offshore to attack French air fields. The Navy pilots succeeded in establishing air superiority, but they could not provide perfect protection to either the transports or the troops ashore. French fighters strafed the transport area and landing beaches at least five times on November 8. The following day French bombers made several high level attacks against both shipping and the troops ashore.[30]

The initial landings at Fedala succeeded, but a high surf slowed the buildup. Artillery, vehicles of all kinds, and supplies were most seriously affected. General Anderson consequently halted his attack well short of his of his D-Day objective. He planned to attack southwest with two regiments abreast the next day with the mission of gaining terrain needed for an all-out drive on Casablanca, now scheduled for November 10.[31]

Anderson's attack jumped off at 0700 on November 9. By midday the 3d Infantry Division had landed three battalions of artillery and had identified the Fedala racetrack within American lines as a suitable field for light plane operations, the prerequisites for sending the Field Artillery aircraft ashore. At 1354 some sixty miles off Casablanca the USS *Ranger* headed into a thirty-five knot wind and launched the three L-4s, festooned with invasion markings. Allcorn, Butler, and Shell flew as pilots; Devol accompanied Butler as an observer. Half an hour later, as they flew along their prescribed course for Fedala, they passed over some of the transports from the invasion fleet.[32]

The light cruiser USS *Brooklyn*, a member of the Central Bombardment Group, was patrolling the northern side of the transport area. Enemy aircraft had attacked the *Brooklyn* that morning on four separate occasions. The ship had its narrowest escape at 0737 when a French bomber dropped three or four bombs in her vicinity, two of which landed within 100 feet of the ship. Adding injury to insult the airmen then strafed the ship. Three marines manning the number three 20-mm. gun were slightly wounded. As a consequence no one aboard was inclined to run any risks as far as unidentified aircraft were concerned. At 1425 the *Brooklyn's* radar detected the three planes at 10,000 yards range. The ship's gunnery control officer hastily consulted the book of Allied aircraft silhouettes and found nothing that resembled these aircraft. (Distribution of L–4 silhouettes was one of those matters that Patton's staff had overlooked during the planning.) Capt. F. C. Denebrink ordered his antiaircraft batteries to open fire. A five-inch round exploded directly behind Shell's aircraft.[33]

The three planes separated and dove for the ocean surface, weaving at an altitude of twenty feet to avoid a curtain of 20-mm. rounds as all the ships in the transport area also opened fire. In short order Allcorn lost his windshield and door to machine gun fire. Several rounds then passed between his body and where his windshield used to be. His engine was only "smoking slightly" when he passed over the shore line, but then the ground forces opened fire. A tank machine gunner put five

DISTRIBUTION OF L–4 SILHOUETTES WAS ONE OF THOSE MATTERS THAT PATTON'S STAFF HAD OVERLOOKED

THE THREE PLANES SEPARATED AND DOVE FOR THE OCEAN SURFACE, ...TO AVOID A CURTAIN OF 20-MM. ROUNDS

Contact! The Continental engine of 2d. Lt. Butler's and Capt. Devol's **L–4** starts aboard the **USS *Ranger*** on November 9, 1942. *(National Archives)*

slugs in one of Allcorn's legs. He lost control and the L–4 crashed. He was just able to crawl from the wreckage before the plane caught fire and then exploded. The other two aircraft veered off to the north. Butler and Devol succeeded in crash landing—but behind the Vichy French lines. Captured, they rejoined their unit after the French surrender. Shell landed on the race track that was their objective, but when he attempted to take off again to try to fulfill the mission of directing artillery fire, he encountered such concentrated friendly small arms fire that he landed immediately. The first American attempt to use air observation posts in combat had ended in a bloody shambles redeemed only by the heroism of the men who made the attempt. No Field Artillery pilot flew an observed fire mission prior to the French surrender on November 11.[34]

HE LOST CONTROL AND THE L-4 CRASHED... THE FIRST AMERICAN ATTEMPT TO USE AIR OBSERVATION POSTS IN COMBAT HAD ENDED IN A BLOODY SHAMBLES

The preceding account appears to be a reasonable interpretation of the existing evidence, but what happened may not ever be known with certitude because that evidence is conflicting and ambiguous. The account in the text is based upon a combination of the Field Artillery annex to the report of the 3d Infantry Division; two letters written by then Capt. (in 1942) Ford E. Allcorn, one dated December 11, 1942, the other April 9, 1957; an interview with Colonel Allcorn by Richard Tierney in March 1962; a letter from Lt. Col. John W. Hansborough to Col. Joseph Rockis, chief of the Historical Division in the Office of the Chief of Army Field Forces, dated June 15, 1948, and an interview conducted by the author with then 1st Lt. (subsequently Col.) John W. Oswalt on January 13, 1982.

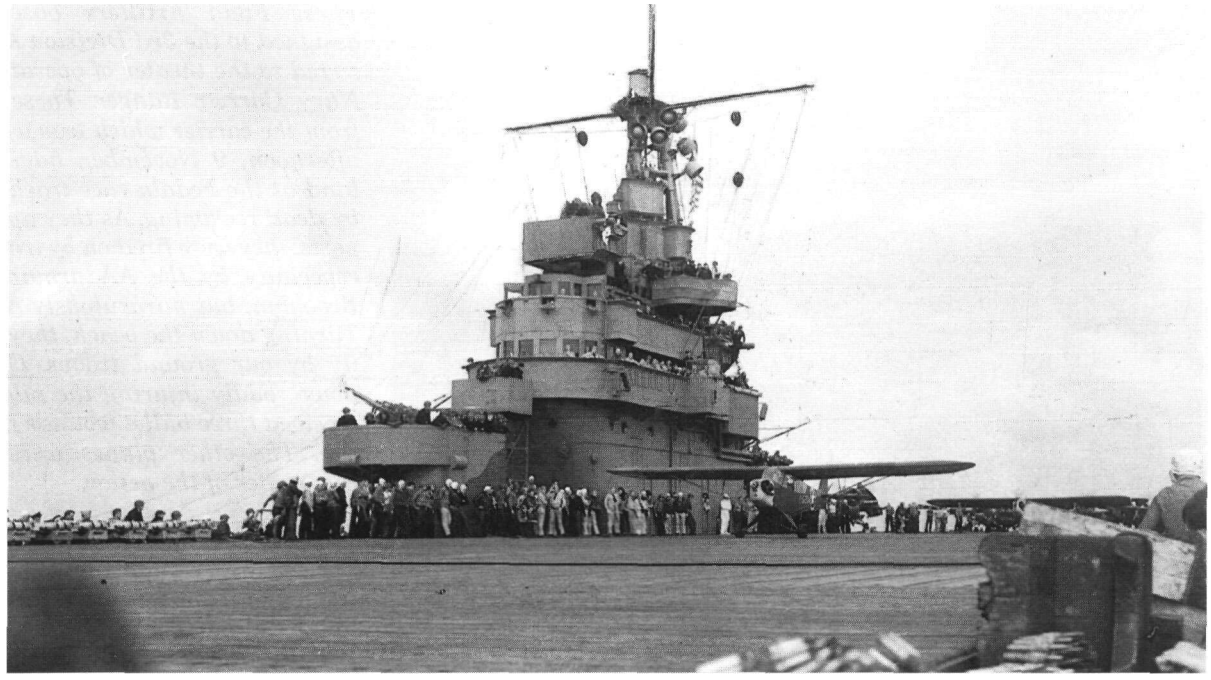
The Field Artillery annex to the final report of the Western Task Force has caused most of the confusion. The only reference to the air observation posts in the annex (there are none in the main body of the report) reads as follows:[35]

Three Field Artillery observation airplanes, assigned to the 3rd Division Artillery, were transferred to the theater of operations aboard the US Navy Carrier Ranger. These airplanes took off from the carrier which was well out to sea in mid afternoon, 9 November, having been ordered to land at the Fedala race track. They flew low and by dead reckoning. As they approached the transports, they were fired on by transport AA guns and especially by the AA armament of the cruiser Brooklyn, but miraculously reached shore safely. Turning down the beach, they were fired on heavily by our ground troops. One plane was shot down, badly injuring the pilot who already had received three bullet wounds from our small arms fire. The other planes were grounded for the remainder of the action.

Both the report and the annex are undated, but give every indication of having been prepared immediately after the French surrender. (The cover letter of the report of sub task force BRUSHWOOD responsible for the direct attack on Casablanca is dated December 8, 1942). George F. Howe, the historian at the Office of the Chief of Military History assigned to write the North African volume in the United States Army in World War II series, located this passage and not unreasonably concluded that the other two aircraft "landed safely."[36]

Captain Allcorn's aircraft was shot down first. He was severely wounded and evacuated to the United States. His December 11, letter to Col. William W. Ford concentrates solely upon his own traumatic personal experiences. Given the sequence of events, there was no reason to expect him to know what happened to the other two aircraft after he was shot down. He certainly says nothing about them. The 1962 interview with Mr. Tierney covers this same ground. The second letter of April 9, 1957, in response to a prior letter from William E. Vance of the *U.S. Army Aviation Digest* staff, provides a complete account of the action. (This was part of the preliminary research that led to the publication of the Richard J. Tierney and Fred W. Montgomery volume, *The Army Aviation Story).* Naturally, Allcorn had a special interest in what happened and over the years had made inquiries. His letter represents second-hand evidence, but he had access to sources no longer available. In 1957 he had no motive to magnify the degree of the disaster that overtook the first three artillery aircraft to venture into combat. He was still on active duty and a strong advocate of expanding Army aviation. He told Vance that the other two aircraft flew north along the beach and were forced to land near a French fort.[37]

After loading Allcorn and his fellow pilots aboard the *Dallas* at Norfolk, Colonel Hansborough was ordered to report to Headquarters, XII Air Support Command as liaison officer from Headquarters, Western Task Force. On November 9, he was acting in this capacity on the beach at



The three Army L–4s are spotted on the USS *Ranger's* flight deck preparatory to takeoff on November 9, 1942. *(National Archives)*

THE AIR OBSERVATION POSTS WERE VERY MUCH ON TRIAL IN LATE 1942 AND EARLY 1943

Fedala when he saw the three Cubs desperately trying to reach shore.

Due to the lack of knowledge that American units were equipped with these planes, all weapons within range opened fire. Two planes made forced landings inland and later moved to the rendezvous at the race track. One plane, piloted by Captain Alcorn [sic] was shot down and burned. Captain Alcorn was severely wounded and evacuated to the United States where he recovered, was an instructor at Fort Sill, and later went overseas with a division artillery.

Hansborough was an eyewitness to Allcorn's fiery crash, but once the other two aircraft passed out of his line of vision he was dependent upon hearsay evidence, just like Allcorn. His account is relatively nonspecific about the fate of the other two, other than that they were forced to land (presumably inside friendly lines) but eventually made it to the racetrack. He might well have seen them there after the French surrender. Hansborough was generally correct about Allcorn's subsequent record. At the Department of Air Training he was called "Ace," because for a long time he was the only member of the staff with air combat experience. He returned to the Mediterranean Theater of Operations as the artillery air officer of the IV Corps and finished the war in the same position at Sixth Army Group.[38]

SCATTERED LIGHT AIRCRAFT IN NORTH AFRICA, HAD NOT YET ENTERED INTO COMBAT

Lieutenant Oswalt was one of six pilots aboard the transports in the invasion fleet and consequently was a spectator for part of the action. He landed on November 13, and, after assembling his aircraft in Casablanca, flew out of a field at Aine Saba, just north of the city. He thus had ample opportunities to see Lieutenant Shell, Captain Devol, and Lieutenant Butler after the latter two were released by the French. His sources of information would have been considerably more voluminous than Allcorn's and Hansborough's and fresher than Allcorn's. Oswalt provides the only detailed account of what happened to Shell. Consequently, I accepted Oswalt's account that Shell succeeded in landing within friendly lines but was forced to abort his first, and only, fire direction mission due to intense friendly small arms fire. This is entirely consistent with the absence of any prior training by the air sections with the ground units engaged in the operation. Oswalt subsequently succeeded Shell as the artillery air officer of the 1st Armored Division after the latter was killed in action in Tunisia.[39]

By the rules of "best evidence," the artillery annex should take precedence over these other sources, all other things being equal. It was written by the 3d Infantry Division Artillery staff shortly after the events described, based on reports that are no longer available. The contrary evidence was recorded six, fifteen, and forty years after the action, and in the last case was oral rather than written. Certainly, the Western Task Force artillery commander, Col. J. B. B. Williams and his staff had the best opportunity to render a full and accurate account, but my conclusion is that they did not. The air observation posts were very much on trial in late 1942 and early 1943 and the outcome of the innovation in combat was still debatable and would remain so until at least the latter stages of the Tunisian campaign.[40]

These scattered light aircraft in North Africa, had not yet entered into combat—other than the disastrous fly-off from the *Ranger*—when Williams signed the artillery annex. They represented the culmination of a long campaign by the Field Artillery to obtain its own aircraft to provide the reliable aerial observation that so many artillerymen considered indispensable for their

new methods of fire control. Now the accidents of war threatened to deprive the Field Artillery of its long-sought-after observation platforms before they had even trained with the troops they would support. Williams' account is very straightforward until he reports the loss of Allcorn's aircraft, but the last sentence, "The other planes were grounded for the remainder of the action," is ambiguous enough that it would imply the Howe interpretation but not contradict the accounts by Hansborough, Allcorn and Oswalt. I suspect that ambiguity was deliberate. Colonel Williams and his staff did not lie but neither did they hand the enemies of organic aviation any "brickbats" to throw at the program. The account of this incident given earlier is, I believe, the best rendering of the contradictions. If additional evidence surfaces, of course, the narrative is subject to change.

Williams' report might gloss over the incident off Casablanca, but there were too many witnesses, some of them unfriendly, for anyone to attempt a genuine coverup. Some officers in Headquarters, Army Air Forces, had long contemplated reversing the War Department decision establishing the Air-Observation-Post Program. It was probably not coincidental that General Arnold's staff forwarded such a proposal to the Chief of Staff exactly ten days after Allcorn's plane burned on the beach at Fedala. The Army Air Forces paper did not mention Casablanca by name, but then none of the official reports had yet arrived. Headquarters, Army Ground Forces, anticipated Arnold's staff by proposing that all other "interested" branches receive their own organic aircraft. The War Department General Staff after holding the papers for several months without action simply decided to continue the status quo.[41]

ARMY AIR FORCES, HAD LONG CONTEMPLATED REVERSING THE WAR DEPARTMENT DECISION ESTABLISHING THE AIR-OBSERVATION-POST PROGRAM

Allcorn, evacuated to Walter Reed Army Hospital in Silver Spring, Maryland, soon found a member of General McNair's personal staff at his bedside anxiously inquiring as to the captain's opinion on whether the Moroccan experience invalidated the air observation post concept. The captain thought not and soon said as much in a vivid letter to Ford describing his experiences. Ford forwarded the letter to McNair, at the same time observing that the real problem was lack of opportunity to train with the Navy and the ground forces. McNair agreed and circulated Allcorn's account to key people in the War Department, especially the chief of staff of the Army, General George C. Marshall, Jr. Since approving the test of the air observation post concept in December 1941, Marshall had done nothing overt—simply monitoring the situation, content to allow his subordinates to handle the issue. Having read Allcorn's letter, he continued to do the same—in itself the best evidence that the action around Casablanca would not change War Department policies.[42]

THE WAR DEPARTMENT GENERAL STAFF ... SIMPLY DECIDED TO CONTINUE THE STATUS QUO

The result requires some explanation. The Air-Observation-Post Program was very controversial and aroused strong emotions both among Field Artillery and Air Corps officers. A public failure—really a total failure in front of an invading army—the first time light planes entered combat was not, to say the least, the outcome best calculated to ensure the long term prosperity of the Field Artillery's aviation program. One of General Arnold's most convincing arguments was that Piper Cub-like aircraft could not survive modern combat. Superficially, after TORCH the situation appeared very promising for Headquarters, Army Air Forces, to throttle this innovation before it went any further. Yet, efforts to that effect produced only bureaucratic stalemate. Three factors were involved: the tactical problem the Field Artillery faced; the institutional context, including the personalities of the decision-makers involved; and the nature of the failure off Casablanca.

The Field Artillery occupied a much weaker position in the Army hierarchy in November 1942 than it had one year earlier. Most significantly, the March 1942 reorganization of the War Department General Staff had abolished the Office of the Chief of Field Artillery. (General Danford had already retired for age in February.) Gone with the office were all the links, formal and informal, that connected it with the higher leadership of the Army. Equally important, no one individual could represent himself as speaking exclusively for the Field Artillery position. The Commanding General of Army Ground Forces, General McNair, assumed all the functions performed by the Chief of Field Artillery (and by the chiefs of the other ground combat branches). McNair had long doubted the wisdom of the Air-Observation-Post Program, but he was now forced by circumstance to become its chief proponent. At the same time the reorganization increased the power of the Army Air Forces, which was clearly in a coordinate position with the ground Army. These organizational changes, at best, only make the persistence of light aircraft in the Field Artillery even more difficult to understand.[43]

The fundamental explanation of the endurance of the innovation was that it was intended to solve a genuine problem and that there were no alternative solutions readily available. And it was not just any problem that Field Artillery aviation addressed but a significant aspect of "the" problem that had faced army officers of all the major powers since the mid-nineteenth century: How did ground forces achieve decisive victory without prohibitive losses on the industrial age battlefield? One of the issues that pointed toward a solution, one yet to be solved by the U.S. Army at the end of World War I, was the question of artillery-infantry liaison. A whole generation of American Field Artillery officers had devoted themselves to solving this riddle in a careful, systematic, step-by-step fashion. The air observation post was the final piece in this quest. The reformers were not about to give up the substance of reform because of one setback. But, of course, the

number of Field Artillerymen who understood where organic light planes fit into the new artillery system was still a minority among members of their own branch in November 1942.

The Field Artillery did not grapple with this problem in isolation. The primary consumers of artillery fire, the infantry, knew that American artillery on the 1918 model was not flexible, not responsive, and all too often not helpful. A solution to the artillery-infantry liaison problem promised at the very least to reduce infantry casualties. The Field Artillery thus had built-in support for its reform agenda in the largest and most powerful combat branch in the service in terms of internal institutional politics.

AIR-GROUND TRAINING... FOR TORCH COLLAPSED DUE TO THE ARMY AIR FORCES FAILURE TO PROVIDE **ADEQUATE...** AIRCRAFT

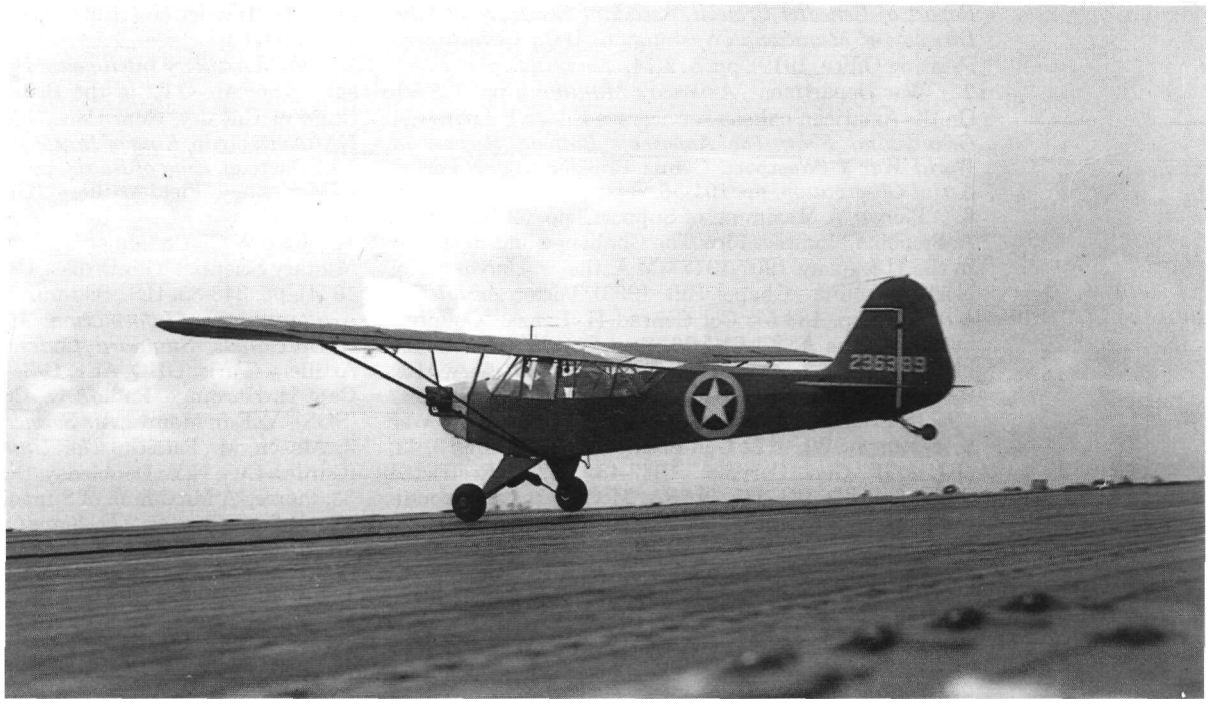
Nor were individual members of this constituency simply passive recipients of the benefits of reform. Between 1938 and 1942 the Chief of Field Artillery had to maneuver against intense and mainly effective opposition from the Air Corps and later the Army Air Forces to obtain War Department sanction for a test of the concept. To succeed General Danford had to obtain support from outside the Field Artillery–and he did. Assistant Secretary of War McCloy, Brig. Gen. Dwight D. Eisenhower, Brig. Gen. Mark W Clark, Maj. Gen. Lloyd Fredendall, and Lt. Gen. Walter Krueger were among those who publicly supported the Field Artillery's aspirations. Others, like General Patton and Lt. Gen. Jacob L. Devers supported the utility of light aircraft in combat. As Silvan S. Tompkins pointed out over thirty-five years ago concerning the abolitionists, every set back that the reformers and their allies suffered became an opportunity for the individuals involved to reevaluate the issues in their own minds. Did the question of organic light aircraft in the Field Artillery warrant their continued investment of time, energy, and effort required to agitate the question and (when the Air Corps once again prevailed) the levels of frustration they experienced? Those officers who persisted through these setbacks of necessity increased their psychological sense of personal identification with air observation posts. Paradoxically, the Air Corps' very bureaucratic skill had created an informal band of brothers dedicated to pressing this reform agenda through to success.[44]

ARNOLD SAW CASA-BLANCA AS AN OPPOR-TUNITY TO KILL ORGANIC AIR IN THE FIELD ARTILLERY

General McNair joined that band of brothers in 1942. In his views of military subordination, McNair was very much an officer of the old school. When superior authority decided against an officer's own personal preference, he was honor-bound to go all out to make the new policy work. McNair was in this mood regarding the Field Artillery aviation program during the summer of 1942. Then air-ground training for the troops who would soon be earmarked for TORCH collapsed due to the Army Air Forces failure to provide adequate types and numbers of aircraft for the maneuver season. This denouement led McNair's staff to conclude that the Army Air Forces simply did not consider the training of ground troops a priority. At this juncture General Edwards descended on the Department of Air Training at Fort Sill. In the process he jumped several levels in the chain of command and outraged McNair. By his actions Edwards seemed to imply that either McNair did not know or understand what his subordinates were doing or that he was conniving with them to contravene War Department policy. Thereafter McNair's advocacy of air observation posts had a passion heretofore absent. It was if he intended to demonstrate to General Arnold just who had the better understanding of the demands of combat and possibilities of technology in modern war. Whereas Arnold saw Casablanca as an opportunity to kill organic air in the Field Artillery, McCloy and McNair used it as an occasion to expand the concept to the other combat arms. In the process, McNair became so identified with the program—as McCloy and Clark had done earlier—that his reputation became bound up with its success, giving him yet another powerful motive to continue as an advocate.[45]

The nature of the failure off Casablanca contributed to the willingness of McNair and the other advocates to recommit to the ultimate success of the Air Observation Post Program. In essence it was a very large, very public friendly fire incident. Ford's diagnosis that it was a problem that could be solved by training (and possibly training aids such as aircraft recognition handbooks) resonated with ground officers. Since they had entered the service they had the importance of "sweating the details" of any problem involving combined arms drilled into them. A modern division had so much and so many different kinds of firepower that officers had to carefully prepare any training exercise in peacetime to avoid accidents. Preparation and training were even more important in war. Patton's headquarters, emboldened by the decided advantage that light aircraft would give the invading force, rushed Allcorn and his compatriots into combat before they had an opportunity to train with their parent units. The ground troops did not recognize the light planes as friendly. External factors, thus, rather than ones internal to the program, produced the disappointing results at Casablanca. And these external causes were easy to diagnose and guard against in the future. Air observation posts trained hard with their units in French Morocco and Algeria in the winter of 1942-43.

Casablanca thus became yet another setback, one that led advocates of organic air to simply redouble their efforts. And it was by no means the last failure. Not until the spring of 1943 in the campaign in Northern Tunisia did light planes begin to redeem the high promise that the Field Artillery reformers envisioned for them. And not until the spring of 1944 did the system reach its full sophistication along the Winter Line in Italy and at the Anzio beachhead. By then the U.S. Army Field Artillery was arguably the best in the world, and the air observation posts were a key component in this success.[46] •



2d. Lt. William H. Butler's and Capt Breton A. Devol, Jr.'s, L-4 takes off from the USS Ranger on November 9, 1942. *(National Archives)*

NOTES

1. The author is a historian with the U.S. Army Center of Military History in Washington, D.C. He originally presented this paper at the Society for Military History Conference at Calgary, Canada, in May 2001. He has benefitted from comments by Rebecca R. Raines, Harold R. Winton, Edward M. Coffman, David W. Hogan, James J. Carafano, members of the audience in Calgary, an anonymous reviewer for this journal, and the editor. All statements of fact and interpretation remain the sole responsibility of the author and in no way represent the official position of the U.S. Army or the Department of Defense. War Department (hereafter WD), Table of Organization (hereafter TO) 6-176, Change 1, Oct 29, 42, sub: *HQ* and *HQ* Service Battery (hereafter Btry), Field Artillery (hereafter FA) Battalion (hereafter Bn), 75-mm. Pack Howitzer, Truck-Drawn; Memo, Day for TAG, Sep 26, 42, sub: Changes in FA TO with Incl MFR, [Sep 26, 42], Headquarters (hereafter HQ), Army Ground Forces (hereafter AGF), General (hereafter Gen.) Correspondence (hereafter Corresp.), 1942-48, 320.3 (FA)/60, Record Group (hereafter RG) 337, National Archives and Records Administration (hereafter NARA), Washington, D.C.; Capt. J. W. Oswalt, "The Air OP Is Here To Stay," *Field Artillery Journal* (hereafter *FAJ*), 34 (August 1944): 568-72; Intervs, author with Col J. W. Oswalt, U.S. Army, Ret., Jan 13-14, 82, and with Lt Col Jack R. Forbes, Jr., Jun 5, 93, both at U.S. Army Center of Military History (hereafter CMH), Washington, D.C.

2. Counterbattery fire used sound and flash ranging in addition to ground and aerial observers. These techniques will not be discussed in this paper. Boyd L. Dastrup, *King of Battle: A Branch History of the U.S. Army's Field Artillery,* TRADOC Branch History Series (Ft. Monroe, Va., and Washington, D.C.: Office of the Command Historian, U.S. Army Training and Doctrine Command, and U.S. Army Center of Military History, 1993), pp. 160-76. Mark E. Grotelueschen, *Doctrine Under Trial: American Artillery Employment in World War I* (Westport, Conn.: Greenwood Press, 2001), focused on the artillery of one of the most successful divisions in the American Expeditionary Forces, the 2d Division.

3. For developments in the German Army, see David T. Zabecki, *Steel Wind: Colonel Georg Bruchmuller and the Birth of Modern Artillery* (Westport, Conn.: Praeger, 1994). The British Army is covered by Shelford Bidwell and Dominick Graham, *Fire-Power: British Army Weapons and Theories of War, 1904-1945* (Boston: Allen and Unwin, 1982), pp. 7-146, and David Frasier, *Alanbrooke* (New York: Atheneum, 1982), pp. 63-81. U.S., General Headquarters (hereafter GHQ) American Expeditionary Force (hereafter AEF), *Instructions for the Employment of Aerial Observation in Liaison with the Artillery* (Paris: Imprimerie Nationale, 1917), 19-26; U.S., War Department, Division (hereafter Div.) of Military Aeronautics, *Work of the Observer* (Washington: Division of Military Aeronautics, 1918); Charles DeF. Chandler, "Observation Balloons Serving with Infantry," *Infantry Journal,* 16 (January 1920): 564-65.

4. U.S., AEF, GHQ, *Instructions for the Employment of Aerial Observation,* pp. 27-34; Rpt, Maj Gen George O. Squier, Chief Signal Officer (hereafter CSO), to The Adjutant General (hereafter TAG), Oct 15, 19, *Report of the Chief Signal Officer to the Secretary of War, 1919* (Washington, D.C.: GPO, 1919), pp. 303-09. For a virtual case study of infantry-air cooperation on the Western Front, see Thomas M. Johnson and Fletcher Pratt, *The Lost Battalion* (Indianapolis, Ind.: Bobbs-Merrill Company, 1938).

5. Rpt, Squier to TAG, Oct 15, 19, *Report of CSO,* pp. 303-09; Harold E. Porter, *Aerial Observation: The Airplane Observer, the Balloon Observer, and the Army Corps Pilot* (New York: Harper and Brothers, 1921), pp. 59-67. For an overview of the air war, see Lee B. Kennett, *The First Air War, 1914-1918* (New York: Free Press, 1991) and John H. Morrow, *The Great War in the Air: Military Aviation from 1909 to 1921* (Washington, D.C.: Smithsonian Institution, 1993). The latter is particularly good on European developments. These can be supplemented with James J. Cooke, *The U.S. Air Service in the Great War, 1917-1918* (Westport, Conn.: Praeger, 1996).

6. Richard L. Pierce, "A Maximum of Support: The Development of U.S. Field Artillery Doctrine in World War I" (M.A. thesis, Ohio State University, 1983), p. 48; U.S., War Department, *America's Munitions, 1917-1918:*

Report of Benedict Crowell, Assistant Secretary of War, Director of Munitions (Washington, D.C.: Government Printing Office, 1919), pp. 572-74.

7. War Department, *America's Munitions,* pp. 323-30. On the American balloon service, see Eileen F. Lebrow, *A Grandstand Seat: The American Balloon Service in World War I* (Westport, Conn.: Praeger, 1998). Porter, *Aerial Observation,* pp. 101-56.

8. Pierce, "A Maximum of Support," pp. 52-54; Steven A. Stebbins, "Indirect Fire: The Challenge and Response in the U.S. Army, 1907-1917" (M.A. thesis, University of North Carolina—Chapel Hill, 1993); Porter, *Aerial Observation,* pp. 133-57; Col Conrad H. Lanza, "Counter-battery in the AEF," *FAJ* 26 (Sept-Oct 36): 464. Lanza had been the S-3 on the staff of the chief of artillery, AEF.

9. Porter, *Aerial Observation,* pp. 157-210.

10. In Ltr, John J. McCloy, Assistant Secretary of War (hereafter ASW), to Lt Gen Lesley J. McNair, Mar 3, 42, HQ, AGF, Gen. Corresp., 1942-48, 353/2 (Restricted [hereafter R]), RG 337, NARA, McCloy recalled conditions on the Western Front. See also, Rpt, Brig Gen A. Hero, sub: Report of Field Artillery Board, AEF, on Organization and Tactics, Morris Swett Technical (hereafter Tech.) Library (hereafter Lib.), Field Artillery School (hereafter FAS), Ft. Sill, Okla.

11. P. T. Quinn, "The Flying Battery Commander," *FAJ* 17 (Jul-Aug 27): 391-93, discusses instruction techniques at Fort Sill. Maj C. M. Busbee, "Liaison between Infantry and Field Artillery within a Division—Methods in Use to Date and Developments Pending," *FAJ* 18 (Jan-Feb 28): 25-35; Maj John S. Wood, "The Liaison Problem," *FAJ* 20 (Jul-Aug 30): 293-303. Memo, Office of the Chief of Field Artillery, (hereafter OCFA), [Jun 7, 32], sub: Air Observation for Ground Troops, in OCFA, *Air Observation for Ground Troops* (Bound Ms., Morris Swett Tech. Lib., FAS, 1932). The most searching analysis of the observation problem during these years is Rpt, Lt Col W. P. Ennis, Assistant Commandant, FAS, to Commandant, FAS, Jun 4, 29, sub: Annual Report of School Year 1928-29, Ms., Morris Swett Tech. Lib., FAS. Maj Gen H. W. Blakeley, "We Must See with Our Own Eyes," *Army* 10 (Mar 61): 62-63, reprints his 1939 article, but see General Blakeley's introduction which comments on how it first came to be published.

12. William J. Snow, *Signposts of Experience* (Washington, D.C.: U.S. Field Artillery Association, 1941), pp. 158-59; Memo, OCFA, [Jun 7, 32]; Rpt, Maj Gen Mason M. Patrick, n.d., sub: Final Rpt of Chief of Air Service, AEF, in Maurer Maurer, ed., *The U.S. Air Service in World War I,* 4 Vols., (Maxwell AFB, Ala. and Washington, D.C.:Albert F. Simpson Historical Center and Office of Air Force History, 1978) 1: 104-60.

13. Memo Order, Office of the Chief of Artillery, American Expeditionary Forces, Dec 8, 18, in Rpt, Brig Gen A. Hero, sub: Report of Field Artillery Board, AEF, on Organization and Tactics, Morris Swett Tech. Lib., FAS; Rpt, Maj Gen J. T. Dickman et al., Jul 1, 19, sub: Report of the Superior Board, AEF, on Organization and Tactics, U.S., Congress, House, *Department of Defense and the Unification of the Air Service: Hearings before the Committee on Military Affairs, House of Representatives...,* 69th Cong, 1st sess (Washington: GPO, 1926), pp. 671-76, 917-94. For commentary, see Robert F. Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964,* AU-19 (Maxwell Air Force Base, Ala.: Air University, 1974), p. 16. Rpt, Col A. McIntyre, Commandant, FAS, to TAG, Jul 20, 39, sub: Rpt of Operations (hereafter Opns) of the FAS for the School Year 1938-1939, FAS Archives, Morris Swett Tech. Lib.; Speech, Brig Gen R. E. Chandler, U.S. Army, Ret., Nov 10, 58, sub: Talk Delivered at the Graduation Exercise, U.S. Army Aviation (Avn) Training Detachment (Fixed Wing), Gary Army Air Field, Camp Gary, San Marcos, Tex., Rex E. Chandler Mss., U.S. Army Military History Institute (hereafter MHI), Carlisle Barracks, Pa.

14. *Field Artillery Intelligence Digest* No. 18, Sep 29, 41, sub: The "Air O.P." in the British Army, Office of the Chief of Cavalry, Gen. Corr., 1920-42, 452.1, RG 177, NARA; Dastrup, *King of Battle,* pp. 196-200.

15. Dastrup, *King of Battle,* pp. 199-200, 206-08; Janice E. McKenney, "Field Artillery" (Unpub. Ms., CMH, 1992), pp. 249-57.

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23. Ltr, Brig Gen Jesmond D. Balmer, Commandant FAS, to CG, AGF, Aug 7, 42, sub: Training Programs for Organic FA Air Obsn Courses at FAS, HQ AGF, Gen. Corresp., 1942-48, 353/58 (FA Air Obsn), RG 337, NARA; Ltr, Bull to CG, AGF, Sep 10, 42, sub: Organic Air Obsn for FA, HQ AGF, Gen. Corresp., 1942-48, 353/79 (FA Air Obsn), RG 337, NARA. For a full account of this controversy and its resolution, see Raines, *Eyes of Artillery,* pp. 98-101, and pp. 120-26, 282-84, for the subsequent evolution of pilot training at Fort Sill.

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25. Intervs, Laurence B. Epstein with Col. Delbert L. Bristol, Jul 1, 75, CMH; with Lt. Col. Joseph M. Watson, Sep 14-15, 76, both at CMH. Draft, Lt Col Delbert L. Bristol, May 6, 57, sub: Insert for History of Army Aviation; Special Orders (hereafter S.O.) 231, FAS, Sep 28, 42 [Extract]; both in Delbert L. Bristol Mss., Mrs. Vivian Bristol, Florissant, Mo.

26. Chester G. Starr et al., *Fifth Army History, 8* vols (Headquarters [hereafter HQ], Fifth Army, 1944-1945), 1:11; Brig Gen Charles E. Hart, "Artillery Representation on High Level Before and During Combat," *FAJ* 38 (Sep-Oct 48): 208-13; Questionnaire, Col T. E. Lewis, Artillery Officer, Fifth Army, [Jul 43], sub: Air-OP Planes, in Rpt, Extracts from Army Ground Forces Questionnaire, in U.S., AGF, *Report of Observer to North African Theater* (Bound Ms., Morris Swett Tech. Lib., FAS, 1943); S.O. 114, 13th FA Brigade, Oct 29, 42; Draft, Lt Col Delbert L. Bristol, May 6, 57, sub: Insert for History of Army Aviation, Bristol Mss.; Interv, Epstein with Bristol; Interv, Epstein with Watson. Hart was the deputy corps artillery officer at this time. The earliest expression of Clark's concern about obtaining enough pilots for II Corps is Ind, Maj Gen Mark Clark to CG, AGF, Jun 17, 42, HQ, AGF, Gen. Corresp., 1942-48, 353/1 (FA Air Obsn) (C), RG 337, NARA.

27. Interv, author with Oswalt; Annex, Col Williams. Even air sections assigned to reinforcing units received virtually no opportunity to train with their battalions before departing the continental United States. Interv, author with Strok, Jun 30, 82.

28. Ltr, Lt Col John W. Hansborough, Army Div., Air Command and Staff School, Maxwell Air Force Base, to Col Joseph Rockis, Historical Section, Army Field Forces, Jun 15, 48, Office of the Chief of Army Field Forces (hereafter OCAFF), Special Staff, Historical Section, Manuscript File, "History of AGF" Backup File, Study No. 35, RG 337, Entry 84B, NARA. On Patton's experiences, see Ltrs, Maj Gen George S. Patton, Jr., CG, 2d Armored Div., to Lt Col W. C. Crane, GHQ, Apr 25, 41; Patton to Air Assoc., Inc., Oct 28, 41; both in Gen. Corresp., George S. Patton, Jr., Mss., LC.

29. Ltr, Hansborough to Rockis, Jun 15, 48; Ltr, Lt Col Ford E. Allcorn to W. E. Vance, Apr 9, 57, *U.S. Army Aviation Digest* (hereafter *USAAD)* Files, Ft Rucker, Ala.

30. Howe, *Northwest Africa,* pp. 40-41, 116-34; Samuel Eliot Morison, *Operations in North African Waters,* vol. 2 in History of United States Naval Operations in World War II, 15 vols. (Boston: Little, Brown, 1962), pp. 34-42, 88-114.

31. Howe, *Northwest Africa,* pp. 134-37.

32. *Ibid.,* pp. 137-40; War Diary, U.S.S. *Ranger,* CV-4, Nov 9, 42, 1354, World War II Ships Diaries, RG 38, NARA; Annex, Williams.

33. War Diary, U.S.S. *Brooklyn,* CL-40, Nov 9, 42, World War II Ships Diaries; Rpt, U.S.S. *Brooklyn,* CL 40, Nov 16, 42, sub: Action Report Covering "TORCH" Operations in Fedala-Casablanca Area on November 8th and 9th 1942, World War II Action and Operational Reports; both in RG 38, NARA; Ltr, Capt Ford E. Allcorn to Col William W. Ford, Dec 11, 42, Personal Corresp of Lt Gen Lesley J. McNair, 1940-1944, "F," RG 337, NARA; Interv, author with Lt Gen Robert R. Williams, U.S. Army, Ret., Feb 20, 91, CMH.

34. Ltr, Allcorn to Ford, Dec 11, 42; Interv, author with Oswalt; Ltr, Hansborough to Rockis, 15 Jun 48; Ltr, Allcorn to Vance, 9 Apr 57; Howe, *Northwest Africa,* pp. 171-74.

35. None of the ships' names are underlined in the original. Annex, Williams.

36. Ltr, Maj B. C. Price, Adjutant General (hereafter AG), 3d Infantry (hereafter Inf.) Div., to Commanding General (hereafter CG), Western TF, Dec 8, 42, sub: Operations Report, Sub-Task Force BRUSHWOOD, in Western Task Force—Annexes to Final Report—Operation TORCH, 95-TF3-0.3, Annex 2, World War II Operations Reports, 1940-48, North African-Mediterranean Theater of Operations, RG 407, NARA; Howe, *Northwest Africa,* p. 139.

37. Ltrs, Allcorn to Ford, Dec 11, 42; Ltr, Allcorn, to Vance, Apr 9, 57; Interv, Richard J. Tierney and Fred Montgomery with Col Ford E. Allcorn, Mar 62, *USAAD* Files, U.S. Army Aviation Museum Library, Ft. Rucker, Ala. Richard J. Tierney and Fred W. Montgomery, *The Army Aviation Story* (Northport, Ala.: Colonial Press, 1963).

38. Ltr, Hansborough to Rockis, Jun 15, 48; Interv, author with Oswalt, Jan 13, 83.

39. Interv, author with Oswalt, Jan 13, 83; Ltr, Col John W. Oswalt, U.S. Army, Ret., to Richard [Tierney], May 27, 74, *USAAD* 20 (May 74): 12-13. Memo, undated, sub: Army Aviation Fact Sheet—1942-49 Period, Col John W. Oswalt, U.S. Army, Ret., CMH. For a description of air operations at Fedala in December 1942, see Alfred W. Schultz, *Janey: A Little Plane in a Big War* (Middletown, Conn.: Southfarm Press, 1998), pp. 14-18; MFR, author, Jul 8, 01, sub: Conversation with "Dutch" Schultz, author's files. Schultz knew that happened to Devol but not Shell.

40. Ltrs, Allcorn to Ford, Dec 11, 42; Price to CG, Western TF, Dec 8, 42.

41. Memo, Maj Gen G. E. Stratemeyer, Chief of Air Staff, for CSA (Attn: G-3 Div.), Nov 19, 42, sub: Organic Liaison Aviation for the Ground Forces; Memo, McNair for CSA, Nov 16, 42, sub: Organic Air Obsn for AGF Units; Draft Memo, [CSA] for CG, AGF, [Nov 42], sub: Same; all in HQ, AGF, Gen. Corresp., 1942-48, 353/150 (FA Air Obsn), RG 337, NARA. For a complete account, see Raines, *Eyes of Artillery,* pp. 103-06.

42. Ltr, Allcorn to Ford, Dec 11, 42; Ltr, Lt Gen Lesley J. McNair to Col W. W. Ford, Jan 7, 43, Personal Corresp. of Lt Gen Lesley J. McNair, "F," RG 337, NARA.

43. On the Marshall reorganization of the War Department, see: Kent Roberts Greenfield, Robert R. Palmer, and Bell I. Wiley, *The Organization of Ground Combat Troops,* U.S. Army in World War II (Washington, D.C.: Historical Division, 1947), pp. 148-53; James E. Hewes, *From Root to McNamara: Army Organization and Administration, 1900-1963,* Army Historical Series, (Washington, D.C.: U.S. Army Center of Military History, 1975), pp. 82-83.

44. Note, McNair, 13 May [42], on Ind, Capt L. Duenweg, AAG, HQ, AGF, to CSA, May 1, 42, HQ, AGF, Gen. Corresp., 1942-48, 353/1 (R) (FA Air Obsn), RG 337, NARA. On McNair's attitudes, see Raines, *Eyes of Artillery,* pp. 60, 76-78. Silvan S. Tompkins, "The Psychology of Commitment: The Constructive Role of Violence and Suffering for the Individual and for His Society," *The Antislavery Vanguard: New Essays on the Abolitionists,* Martin Duberman, ed. (Princeton, N.J.: Princeton University Press, 1965), pp. 270-89.

45. Memo, McNair for CSA, (Attn: ACS, G-3), Oct 20, 42, sub: Organic Air Obsn for FA, Office of the Assistant Secretary of War, Security Classified Corresp. of John J. McCloy, 1941-45, 452.1 (Puddlejumpers), RG 107, NARA; Memo, McNair for CSA, Nov 16, 42, sub: Organic Air Obsn for AGF Units; Draft Memo, [CSA] for CG, AGF, [Nov 42], sub: Same; both in HQ, AGF, Gen. Corresp., 1942-48, 353/150 (FA Air Obsn), RG 337, NARA.

46. For a discussion of the sophisticated air-observation-post system, see Raines, *Eyes of Artillery,* pp. 161-82.