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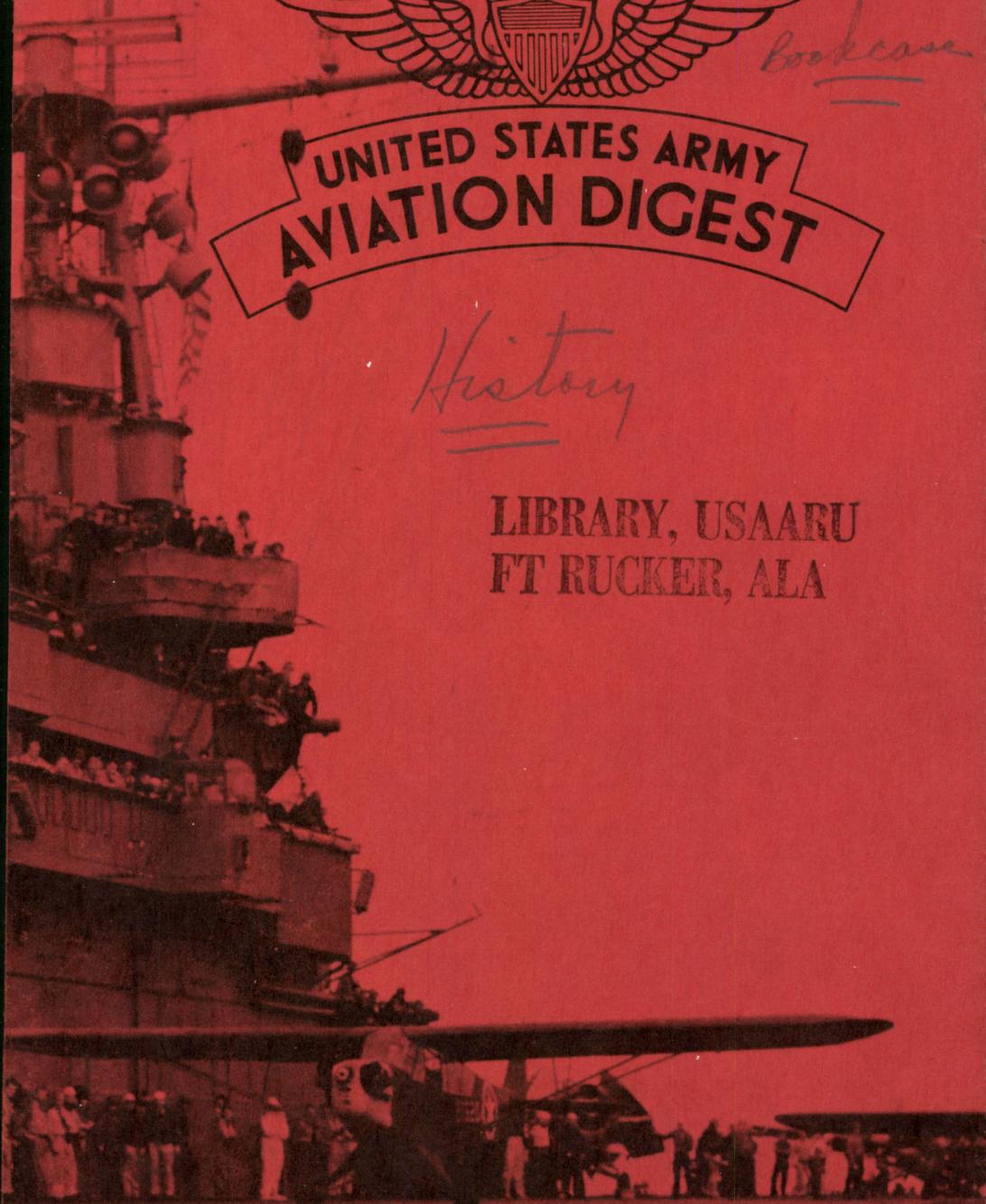


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**UNITED STATES ARMY
AVIATION DIGEST**

History

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**THE UNITED STATES
ARMY AVIATION SCHOOL
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U. S. ARMY AVIATION DIGEST

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The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research, and development, aviation medicine, and other related data.

Manuscripts, photographs, and other illustrations pertaining to the above subjects of interest to personnel concerned with Army Aviation are invited. Direct communication is authorized to: Editor-in-Chief, U. S. ARMY AVIATION DIGEST, U. S. Army Aviation School, Fort Rucker, Alabama.

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NG: State AG.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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Volume 3

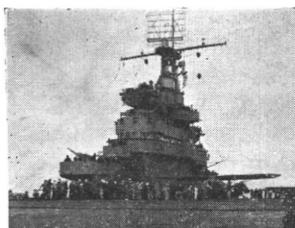
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COVER



One of the most notable "firsts" in U. S. Army Aviation occurred on 8 November 1942 when three L-4s took off from the U.S.S. RANGER located 60 miles off the North African shore. Captain (now Lt Col) Ford E. Allcorn's airplane, shown poised on the RANGER's deck, was the first Cub to take off from an aircraft carrier. This and other highlights in the 15 busy years of Army Aviation will be found in the history beginning on page 7.



*Wilber M. Brucker
Secretary of the Army*

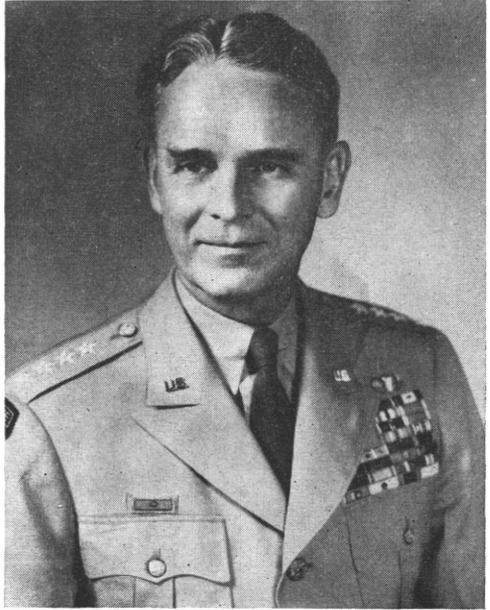
To the Officers and Men of the Army Aviation program.

It is a pleasure to congratulate you, the officers and men of the Army Aviation program, on the occasion of the 15th Anniversary of integral Army Aviation.

Because of your astuteness and industriousness our new, streamlined, atomic-age Army has impressive air mobility. In line with our goal of putting into the hands of troops new weapons that will extend their capability, the program's increased use of organic Army helicopters and light, fixed-wing planes has literally given wings to the ground soldier. As a result of the Army Aviation program, we will be able, on any future field of battle, to air-transport troops and supplies where and when needed, and in quantities necessary for success. Also, as a result of the program, organic aircraft will provide us with the superior battlefield observation, liaison and medical evacuation, which together with fire-power and movement, will be prime factors in deciding the outcome of any war in which the United States may become engaged.

You, in the Army Aviation program, have shown by your outstanding achievements and progress that you are imbued with the "look to the future" attitude of mind which characterizes today's Army. We are proud to have you on our great, versatile, patriotic Army team.

Maxwell D. Taylor
General, United States Army
Chief of Staff



On behalf of the men and women of the Army, I extend congratulations and best wishes on the occasion of the fifteenth anniversary of Army Aviation.

As the pioneer in the development of military aviation, the Army has always directed its efforts toward utilizing aircraft to enhance the mobility, flexibility, and battle efficiency of its forces. The integration of low-performance aircraft into the Army structure—thereby expediting reconnaissance, improving target acquisition, and permitting rapid shifts of men and supplies about the battlefield — augments the combat capability of the Army. The characteristic responsiveness of Army Aviation to the requirements of combat commanders coupled with the professional ability of soldier-pilots provide the fundamental characteristics necessary to fulfill the Army's organic aviation needs.

I join with every member of the Army in expressing pride in the accomplishments of Army Aviation during its relatively short history and in voicing confidence in its ability to perform increasingly important functions in the future.

Future of Army Aviation

Major General Hamilton H. Howze, USA
Director of Army Aviation, ODCSOPS

WHEN THE EDITOR-IN-CHIEF asked me to prepare an article under this title he obviously anticipated a discussion of the statistics of the build-up in Army Aviation, plus a dissertation on new aircraft types which we expect to come into being. But senior officers habitually rebel against doing what junior officers know they should do, so I shall tackle the question from a very different point of view.

I should like to tell you in these few paragraphs what I consider to be the *keys* to the future.

A primary factor affecting the growth of aviation in the Army is its utilization. I believe that the combat arms of the Army are in fact awakening to the possibilities offered by the use of aircraft in the conduct of military operations, but this sort

of realization does not usually come rapidly, if only because the Army is a very large organization. And while I do not think that the military man is as conservative as the press gives him credit for being, it is of course true that the soldier's responsibilities in battle are heavy, the stresses of war severe, and the penalties for error *very* severe. One does not therefore embark lightly on radical departures from tactical methods which have been tried and found true in the past.

I nevertheless believe that the use of light aircraft should have revolutionary effect on the tactics of the Army. The problem, therefore, is how the Army is to become convinced of this, how the Army may best proceed toward achieving new and greater combat capabilities through the



skillful use of light aircraft and helicopters.

The major part of the solution to the problem must be provided by Army Aviation itself. We must develop a capability so obviously good that it is apparent to all who are confronted with it.

This capability must be developed partly by the creation of new and better aircraft types, and that development must in turn come from a properly conducted research program. I think that the Army has such a program; whether it is everything it should be is of course debatable, and we will never have all the money for it which we might profitably use. But the aviation industry is greatly interested in this field of aeronautical development, and I believe that the Army's requirements in this respect will be met.

Second, the capability of aviation to do its job must be repeatedly demonstrated; merely talking it up won't do. This most essential requirement must be met by those of us who comprise Army Aviation: pilots, ground crews, and operations personnel.

It is a simple rule of thumb, rarely proven wrong, that a good unit looks good. This is true even in the midst of battle — a unit may be ragged and unshaven, but if it is properly trained and disciplined it will nevertheless exude a spirit and a will-to-do which is obvious. And in garrison a good unit looks good from every point of view — in dress, in military bearing, in alacrity of reaction to new situations, in alertness and courtesy. A good outfit's surroundings are clean, no matter how

austere they may be, and its facilities are smartly and efficiently run.

A good unit is marked by a high standard of discipline, discipline which is reflected in its appearance as just described, in the condition of its equipment, and in its execution of its training mission. This discipline carries over into the actions of the pilots operating on their own far from the possibility of detailed supervision by their superiors.

Our combat capability will be further demonstrated by courage — courage to meet the requirements of our brand of flying. In this respect I am very proud to say that Army Aviation stands mighty tall. Great contributions to our professional future were made again and again in the recent past — in the gusty depths of the Grand Canyon, in the heat of the Venezuelan and Ecuadorian jungles, in the floods in New England and California, and in the black night above the rising Han River of Korea. The pilots and crews participating in these splendid endeavors, superbly executed amid circumstances of considerable peril, provide not only inspiring examples, these are, additionally, obvious manifesta-

tions of the capability of Army Aviation.

Finally, let me say that our future lies partly in our own initiative and imagination. We must take our capability, combine it with courage, and display the result to the rest of the Army in such fashion that the utility of aviation will be completely and convincingly obvious. This requires of our aviators more than the bare ability to pilot the aircraft, however important that may be. Army Aviation vitally needs competent *technicians*, but we also need *commanders* and *tacticians*. An officer charged with the command of an Army Aviation unit is faced with a great challenge to his personal abilities, for he must meet fully the technical demands of his position, yet develop and nurture the tactical understanding necessary to support ground units to the limit of the great possibilities inherent in aviation. I know of no other category of job more demanding on the individual. Our commanders cannot be too smart, too brave, too ingenious, or too imaginative.

In the individual — commander, pilot, and crewman — lies the future of Army Aviation.

History of Army Aviation

William E. Vance

BORN OF THE BATTLEFIELD necessity for improved artillery observation, and easily adapting its unique capabilities to other varied and critical tasks, Army Aviation has advanced with seven-league strides since its inception June 6, 1942.

From the humble beginning at Fort Sill, Okla., through the years of warfare which followed, Army Aviation played an increasingly important role in the hostilities as commanders came to realize its many potentialities.

Continuing to improve its role by testing and adapting new aircraft, Army Aviation was ready to come of age when the fighting broke out in Korea. Teaming up its past-proved highly successful fixed-wing aircraft with the vastly more versatile helicopter

—seemingly designed especially for the rugged terrain encountered in Korea—Army Aviation displayed new and outstanding capabilities which firmly established it as a vital part of any armed force.

Present day activities of Army Aviation serve as an interesting curtain raiser to an exciting future in which one can easily visualize vertical takeoff and landing aircraft, flying cranes, and flying jeeps in addition to other projects still on the drawing boards.

Although Army Aviation is celebrating its 15th anniversary, aerial observation for military purposes dates back to the Civil War. A balloon company attached to Union forces under command of General McClellan gained information of Confederate troop movements in the vicinity of Richmond. The U. S. Army also used balloons for a similar purpose during the Spanish-American War, and by this time, most of the world powers had

William E. Vance is Editor of the U. S. ARMY AVIATION DIGEST. Views expressed in this article are the author's and are not necessarily those of the Department of the Army or of the U. S. Army Aviation School. — The Editor

established balloon corps in their armies.

Observation balloons in use during World War I suffered with the appearance of combat airplanes, and this type of duty became extremely hazardous. Since then the airplane has been the principal means of aerial observation.

Before World War II, aerial observation was furnished by the Air Corps Division and Corps aviation squadrons. The type of aircraft development forced the separation of the observation aircraft from the supported units. Disturbed by inadequate support in this area, many Army officers discussed means of overcoming the shortcomings of the system. In 1941, Major William W. Ford (now Brigadier General, USA, retired) wrote an article advocating use of commercial aircraft for the adjustment of artillery fire. In this article, which appeared in the **ARTILLERY JOURNAL**, Maj Ford suggested that these aircraft be organic to the units they served. The article caught the attention of Major General Robert M. Danford, then Chief of Field Artillery, and his interest was further extended when, during a visit to the British Artillery School several months later, he saw experiments along this same line being conducted by the British.

LOUISIANA MANEUVERS

Permission was obtained to use aircraft of Piper, Aeronca, and Taylorcraft design in the Louisiana maneuvers of 1941. General Danford, in his report, stated ". . . Only uniformly satisfactory report of air observa-

tion during the recent maneuvers comes from those artillery units where Cubs . . . were used."

In the fall of 1941, General Danford visited Fort Sill and, during his visit, Maj Ford (then assigned to the Staff and Faculty of the Field Artillery School) pleaded the case for organic aviation for Field Artillery. In the late fall of 1941, a directive was received at Fort Sill to establish a test group for organic aviation for Field Artillery. The directive also included the recommendation that Lt Col Ford be placed in charge of this test group.

From the 18th Field Artillery Regiment, Lt Col Ford "borrowed" First Lieutenant Robert R. Williams (now Col Williams, President of the U. S. Army Aviation Board) and Second Lieutenant Delbert L. Bristol (now Lt Col Bristol, chief of Army Aviation Branch, office Chief of Research and Development, Department of the Army) who formed the nucleus of this new organization. Both of these officers held civilian pilot licenses, and had been experimenting with the use of aircraft for air observation during that year. Major Gordon J. Wolf, a reserve officer in Cincinnati, Ohio, had been corresponding with Lt Col Ford on this subject for some time. Immediate arrangements were made for Maj Wolf to be called to active duty and to proceed to Washington to assist in the selection of officers and enlisted personnel of the Field Artillery with previous pilot experience to complete the test group.

Twenty-four L-4 aircraft were borrowed from the Air Corps

and delivered to Fort Sill. These aircraft were standard J-3 Piper Cub airplanes, painted olive drab. Maj Wolf selected 30 officers and enlisted men from the Field Artillery with CAA pilot licenses who were ordered to report to Fort Sill on or about 1 January 1942.

At the same time the Civil Aeronautics Authority supplied one flight supervisor (Mr. Richard Alle) and one maintenance supervisor (Mr. Stanford Stelle) from their Washington office. The Civil Aeronautics Authority also assisted in obtaining six experienced civilian flight instructors with outstanding records in the flying of light aircraft. On 15 January 1942 the training of the test group began at Fort Sill, Oklahoma. The training program consisted primarily of an elimination process to determine the best qualified of those selected, and some concentrated training in short field landings and take-offs.

On 1 March 1942, the 20 pilots and 10 mechanics, who had survived the training program, were split into two groups. One group was sent to the 2d Division at Fort Sam Houston, Texas, and the other group went to the 31st Artillery Brigade, Fort Bragg, North Carolina, to conduct the tests of organic aviation for Field Artillery. The tests were completed and the reports forwarded in April, 1942. The two test groups reassembled at Fort Sill to await the outcome of the reports.

WAR DEPARTMENT APPROVAL

On 6 June 1942 the War Department approved organic aviation for Field Artillery. Im-

mediately thereafter the Department of Air Training of the Field Artillery School was established, with Col Ford as its director. The members of the test group for Army Aviation provided the nucleus around which the Department of Air Training was built.

Initially the course was for five weeks, but this was gradually extended as time went by. As most personnel with flying experience had already been taken into the Air Corps, special schools were set up at Pittsburg, Kansas, and Denton, Texas, by the Air Corps to provide primary training to prospective Field Artillery aviators. Advanced training, including short field procedures and observer training, was given at Fort Sill. Even with this late start, the program with the help of unit training was able to equip artillery battalions in each of the several theaters with two aircraft and crews at the time of entry into action. This feat was not accomplished without considerable difficulty, however.

Early in September, 1942, the Field Artillery School received classified instructions from the War Department to send ten Field Artillery pilots and ten mechanics to the European Theater as quickly as possible. This was the first requirement placed on the school for sending aviators to tactical units.

The group, most of whom are now high ranking officers, was selected by 14 September and shortly thereafter shipped to England. This group of pilots from Class No. 1 included Captains Joseph M. Watson, Jr., and J. Elmore Swenson; First Lieu-

tenants Stanley A. Williamson, Thomas L. Hendrix, Jr., and Delbert L. Bristol; Second Lieutenants William D. Stephens and Gus M. Albert; Staff Sergeants Claude B. Allen, Jr., James S. Rengers and Walton C. Schoonover. Mechanics were Staff Sergeant William T. Roulston, Jr.; T/4s Cecil L. Tyner and Paul F. Leathers; Corporal Walter H. Hasty; T/5s Hugh M. Blair and Whitney N. Frost; Private First Class John A. Wagner and Privates George G. Rogers and Constantine L. Ryseff.

To the consternation of all, after arrival in England, the group was assigned to the 4th Replacement Battalion and billeted at Whittington Barracks. It was evident an error had been made in interpretation of shipment numbers. The pilots and mechanics were swept up in the training program as infantry replacements.

To salvage a bad situation, the commander of the 34th Infantry Division Artillery, Colonel Francis Bacon, was prevailed upon to organize a provisional field artillery battery under command of Capt Swenson and comprising the remainder of the pilots and mechanics. Within a few days, Capt Swenson departed with a group of men for Tidworth, England, where he drew four 105 howitzers and trucks to provide training equipment for the battery. The morale and spirit of pilots and mechanics declined steadily due to the lack of interest. No one seemed to feel the need for Field Artillery pilots or mechanics.

Prior to the group leaving Fort Sill, Col Ford had foreseen just this possibility and he had

instructed Lt Bristol to contact Brigadier General A. M. Gruenther for assistance and guidance if it should be necessary. Colonel Bacon agreed to take Lt Bristol on a trip to London.

In London, Lt Bristol reported to General Gruenther, who was then Chief of Staff, Hq II Corps, and within a matter of minutes the shipment error was rectified and new orders cut requiring the group to report to the 13th FA Brigade at Perham Down, near Tidworth. Lt Bristol returned to Whittington Barracks and imparted the good news to his fellow officers and the enlisted men.

The high good spirits following this straightening of tangled red tape soon suffered another blow. The group had been selected with the idea in mind of early participation in combat. To a reasonable degree the men had mentally prepared for this eventuality. Upon reporting to the 13th FA Brigade, group members received the surprising news that they were to become the flight instructor nucleus of the II Corps Air Observation Post School which had already been formed, complete with staff, administrative personnel and students.

The Fort Sill contingent was ill-equipped and poorly prepared for an undertaking of this nature. With a good deal of effort, they became accustomed to the idea and wholeheartedly pitched in to make the school a success. Since they had no airplanes, textbooks or training aids, they prepared suitable POIs and instruction material. Finally ten L-4s, earmarked for the 1st Infantry Division, were rerouted to the school and actual training

began.

The II Corps Air OP School progressed satisfactorily and late in November received instructions to move an advance party to North Africa with the 13th FA Brigade. A new school was to be set up there and the 29th Infantry Division also established its own flying school.

CUBS ENTER COMBAT

The first force to employ Air OPs in combat were elements of the Fifth Army almost five months to the day from the anniversary date. On 8 November 1942, three L-4s took off from the U.S.S. RANGER 60 miles off North Africa. Four pilots representing the I Corps were aboard these aircraft: Captain Ford E. Allcorn, First Lieutenant Brenton A. Devol, Jr., First Lieutenant John R. Shell, and Second Lieutenant William H. Butler.

Captain Allcorn, now Lieutenant Colonel and Director, Field Service, Transportation Supply and Maintenance Command, says of this historic event: "Our pessimism was heightened by the fact that a number of Navy aircraft had been shot down by our own forces. We asked the Commanding Officer of the RANGER to break radio silence and inform the units ashore that we were arriving off Fedala shortly, but he refused.

"We checked our 609 radio which we intended using to adjust artillery fire and then were launched. We didn't give much thought to the fact that we flew the first light planes ever to take off from a carrier. We were approximately 60 miles offshore when we became airborne.

"About three miles offshore,

the U.S.S. BROOKLYN opened fire on us. We immediately peeled off and started hopping the waves from there on into shore and received very little damage. I saw Shell and Butler get through all right. I learned later they proceeded north and landed in the vicinity of a French fort, where they were captured and remained prisoners of the French for a time."

Captain Allcorn was seriously wounded by friendly forces .50 caliber machine gun fire and crash landed his airplane in a field near the shore where it burned. After spending some harrowing hours in unfriendly territory, he was evacuated to a U. S. hospital ship. He was the first Field Artillery pilot shot down in a combat operation in World War II.

Other Air OP sections of the I Armored Corps came over the beaches or through ports in the build-up ashore. Hostilities were on the wane in this area and little time was available to use the new Air OPs.

Forces of the II Corps had been moved to reinforce the British Forces in Tunisia. Elements of the 1st Armored Division and the 34th Infantry Division for some time had been fighting in Tunisia and there was a growing demand for air observation. In December, to meet this demand, Fifth Army redistributed planes, pilots and mechanics of the I Corps to II Corps units. One of the first pilots dispatched to Tunisia was First Lieutenant Jesse U. Overall, III, who with two other pilots flew three Cubs from the Casablanca area to Tunisia, a distance of more than 1,000 miles.

Meanwhile, the advance detachment of the II Corps Air OP School had established itself at the airfield at Sidi-bel-Abbes and became a staging area for pilots and mechanics moving to Tunisia. The main body of the II Corps Air OP School arrived in North Africa in early 1943 and the Fifth Army commander decided to expand the scope of the school. The mission was to train pilots and mechanics for the II Corps as well as I Corps.

Pilots, mechanics and planes of I Corps were transferred to the II Corps school and Fifth Army units were combed for officers and enlisted men who had previous flight training and who would volunteer for flight training. Pilots were graduated and assigned to units which were already engaged in combat in Tunisia.

FLIGHT STATUS SNARLED

Operating impromptu schools to fill combat needs inevitably resulted in administrative snarls. Although the War Department had established a policy of placing Field Artillery pilots on flying status, Fifth Army was unable to obtain this status for graduates of the Corps School. As an alternative, authority was obtained to place all graduates on nonrated flying pay which entitled them to receive \$60 per month hazardous duty pay. This situation prevailed until late in 1943 when the War Department decided to return overseas school graduates to Fort Sill for further flight training. By this time, many had seen extensive combat action. A few accepted non-flying assignments rather than return to the uncertain future of

additional training at Fort Sill. Others returned to officially "win their wings."

In early 1943, all major U. S. Army units in Tunisia had received some air sections. These sections were performing duties at considerable variance with the original intent. They were flying many missions not connected with artillery observation.

The uncertainties and unknowns of combat, coupled with a lack of opportunity to participate in unit training prior to combat, all contributed to an initial mediocrity of success in employing Air OPs. Another deterring factor was the complete lack of supply and maintenance support. Although the Air Corps was charged with providing this support, the responsibility had been overlooked in their planning of overseas stock levels and maintenance support units. Improvisation was the key to success in North Africa. Much credit can be given to the engineering officers and air mechanics of the various Air OP sections who had to work doubly hard to keep the Cubs flying.

MORALE DROPS

Artillery commanders were not accustomed to looking out for their observation airplanes. On several occasions, air sections awakened in the morning to find their unit had departed during the night without notifying them. Care and feeding of air section personnel varied from the best possible to that of "begging" for handouts from sympathetic passing units.

As the campaign progressed, considerable improvement was made in integrating the air sec-

tion into the artillery units. A major factor in getting recognition was a banded, enthusiastic group of pioneer pilots plugging against adversity and gaining the support of commanders. Cubs spearheaded General George Patton's crushing armor and both Generals Patton and Omar Bradley found them invaluable for other missions. The use of Air OPs for this purpose rapidly developed into expanding requirements for organic air sections to transport commanders and staff officers throughout the combat zone.

The difficulties over organization and control of liaison aircraft in this period was complicated by the question of what type plane was to be used by the Army. The plane used to adjust artillery fire in the 1941 maneuvers was a field expedient. A Cub with a 65-hp engine designed for civilian use, it was obtained directly from the manufacturer on a loan basis. To take care of the rapid expansion of aviation for the Field Artillery, which indicated that in time and no later than 1943 it would require a total of 2,508 light planes, other types than the L-4 were supplied to the Army. These were Taylorcraft and Aeronca, original designation YO-57 and YO-58. Original designation of the Cub was YO-59.

SHORTAGE OF L-4S

Except for the shortage of L-4s, no difficulty arose until the desire for a different type of plane began to be pressed from the field. The airborne divisions particularly needed a faster airplane to keep up with airborne movements. This request was de-

nied on the grounds that the higher horsepower craft would need more room for takeoff and be less maneuverable in achieving evasion. Another question of equipping the Cubs arose when the Army wanted to use them for missions other than adjusting artillery fire. The War Department strongly reaffirmed the results of artillery observation aircraft, but opposed any other use by ground commanders.

The Seventh Army, invading Southern France and coming up against the lower end of the Siegfried Line, brought with it the airborne controller to direct air strikes. The "Little Brother" act, of the Cub directing the powerful bombers and strafing fighters to objectives, received much attention from writers and reporters of that period.

CUBS PROVE VALUE

Progress of the war in 1944 left not a shadow of doubt that the Field Artillery now regarded its light planes as indispensable. The Germans acquired such a healthy respect for the Cub's ability to spot fires that the very presence of the Air OP had a counterbattery effect.

It was standard procedure for the 2d and 3d Armored Divisions to keep at least one artillery observer in the air during daylight hours. The pilots were daring and resourceful. They were not supposed to fly over enemy lines, but they went "where necessary to see what had to be seen." They became skilled at dodging enemy fighters at tree-top level and in escaping anti-aircraft fire. Casualties from enemy action approximated those of field artillery observers on

the ground.

When the Pozit fuse was introduced, the perils of their flight amid the trajectories of friendly shells were greatly increased. Though hard working and without the public prestige afforded the Army Air Forces, they developed high esprit. This spirit, resourcefulness and daily identification with the life and interests of the troops made them immensely popular.

Uses of Army Aviation expanded with experience gained in combat. The Air OP controlled naval gunfire in landing operations. The Artillery commander of the Americal Division rigged an L-4 with a camera and developed a method of aerial survey in jungle terrain. Early in 1945, a method was developed for instant location of targets on the maps of the Artillery Fire Direction Centers by means of radar fixes on liaison planes.

OTHERS WANTED CUBS

Other branches of the service were aware of the success of the artillery Air OPs and began to demand aircraft for themselves. Early in the war, they had been used by commanders as courier and liaison planes. Every major type of combat unit, except anti-aircraft, found a use for them and borrowed them from the field artillery when it could meet some vital battle need, such as visual and photographic reconnaissance.

One such flight occurred when Lt Shell took his Division Commander, General Orlando P. Ward, deep into unfriendly territory on a two-hour flight that was enlivened by a "forced land-

ing" near a forward outpost to obtain enough fuel to get back to Division headquarters.

The Fifth Army in Italy was meeting a vital need with the Cubs. They were being used for both visual and photo reconnaissance, column control, emergency resupply, speedy evacuation and even close-in bombing. They were in demand for relaying communications between front-line troops, and some bolder spirits were equipping them with rocket-firing units.

FUTA PASS "SKI JUMP"

General Lucius K. Truscott, Fifth Army Commander, spent much of his time visiting the Corps, Division and other units of the Army when forward headquarters was located just off the main road, halfway between Florence and Bologna, near Little Futa Pass in Italy. The General suggested that it would be nice if the airstrip were closer to headquarters. Colonel Jack Marinelli, Chief, Special Projects Branch, Plans Division, DCSLOG, was then a captain and air officer. He contacted the Army Engineer and asked him to build a Cub strip near the CP, the closer the better.

It was finally decided to build a strip on the mountain side with the grade running up and down slope. The Engineers had a good strip in four days, covered with coco-matting and pierced steel plank. The strip was so situated that the aviator had to land uphill and take off downhill. The top part of the strip was surrounded by cliffs and peaks and committed one to landing once the approach was set up.



"Ski Jump" airstrip in Futa Pass, Italy.

"The interesting feature," Col Marinelli says, "was that we had to use full throttle to taxi to the top of the strip after landing. But you could also take off down the strip without power."

PLACE OF NO RETURN

In planning the invasion of southern Europe, one of the serious problems was how to get the L-4 type aircraft into operation during the actual landings. Field Artillery pilots worked with the Navy in developing LSTs into aircraft carriers for the L-4s.

Flight decks were built on top of the LST, using pierced steel plank. The flight deck had to start forward of the super structure of the ship. This made it possible for the L-4s to take off, but no provision could be made for landings. Once the L-4 was launched, it was committed to carry out its mission and then seek some landing area ashore.

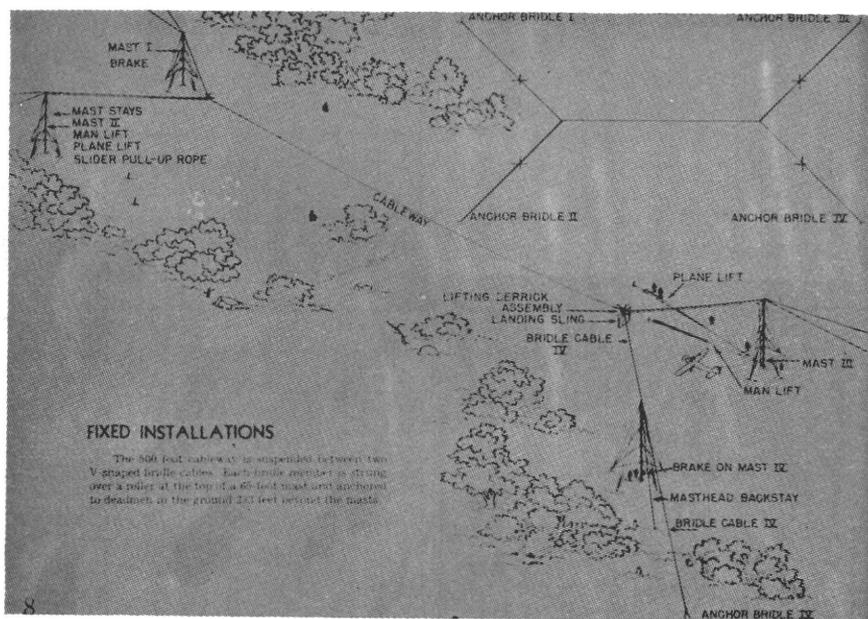
An L-4, flown by First Lieu-

tenant Julian W. Cummings, took off on D-Day from southern France, conducted reconnaissance and directed the fire of battleships with great effectiveness. On completion of this mission, the pilot landed on the rough terrain of the beach. For his action, the pilot was awarded the Distinguished Service Cross, the first such decoration to be earned by an Artillery pilot.

In the Pacific Theater, Army Aviation came into its own much as it did in Europe. The widely scattered units found liaison planes invaluable in covering the great distances. Light planes were used so extensively, in fact, that a jungle and rough terrain landing system was devised.

BRODIE DEVICE

Called the Brodie Device, for its developer, Lieutenant James Brodie, it grew out of his service at New Orleans Port of Embarkation. He visualized it as something to combat the submarine



Brodie Device eliminated landing fields.

menace. Attached to a merchant ship, this device enabled an airplane to be launched and retrieved, providing air cover. In land application, an airplane would land on a wire stretched between two poles.

The Brodie Device was tested at New Orleans Moissant Airport and in the Gulf of Mexico on the *City of Dalhart*. Sometime later a ground system using steel poles for wire suspension instead of ship's booms was set up at Fort Belvoir to demonstrate the Brodie for the late General Leslie McNair, who immediately thought of its application to artillery planes.

Not long after that, the Artillery School began training pilots to use the new technique. When they were graduated they got a bright and shiny turnbuckle instead of wings, because the

Brodie Device used turnbuckles to hold the rig tight. They wore their caps crossways because all this was not quite natural and they saluted one another with a hooked forefinger, in imitation of the hook-and-wire technique.

Lieutenant Brodie's work resulted in the only LST in service having an official name. LST No. 776 was also known as the U.S.S. BRODIE and it played a large part in the invasion of Okinawa. The mission was to set up artillery Long Toms on islands in the Kerama Retto group so they could lob shells into Okinawa's defenses and soften them up for landing parties. Photography and aerial observation were musts. But there were no landing strips in the hills of Keramas, and the winds were hazardous. If an observer took off in a light plane, there was no

place for him to land; it meant losing the plane and maybe the crew, except for the U.S.S. BRODIE.

D-Day on Okinawa, the light planes were flying sorties from the landing strip on shipboard. They flew over the Japs and took pictures; they made notes and maps, and dropped them to a big Navy warship. Then they returned to the LST, landed on the wire, refueled and took off again to repeat the operation. Not a pilot was lost.

CUB AIDS SURRENDER

At the close of the Pacific war, Army Aviation again pulled a chestnut from the fire. After the atom bombs were dropped and the Japanese Emperor sued for peace, General MacArthur announced that the surrender would take place upon the U.S.S. MISSOURI in Tokyo Bay.

The Commanding General of AFWESPAC in Manila promptly announced to the press that General Yamashita would surrender to COMWESPAC at Baguio, lo-

cated in northern Luzon. Headquarters, Luzon Area Command, was directed to make the necessary arrangements. At this point, a staff officer pointed out the embarrassing fact that the matter had not yet been coordinated with General Yamashita. Consternation reigned until someone remembered that, since the air section had done everything else, they may as well do this.

An officer was dispatched bearing a flag of truce into the enemy stronghold. Colonel Howe was flown into the area in an L-4 and the negotiating committee found General Yamashita most cooperative. An Army liaison plane and jeep brought the Japanese General to headquarters in time for the surrender ceremony.

INCREASE REQUESTED

The successes of Army Aviation all over the world led the Army to again put forward a modest proposal for an increase in ground liaison aviation. Information from all theaters in-

Aerial view from Cub dropping message to Yamashita.



icated the greatest need was for light planes for reconnaissance.

The request as finally formulated asked that two each, planes, pilots, mechanics, trucks and three radio sets be added to each cavalry reconnaissance squadron (mechanized). This was rejected on the ground that not enough study has been given to the employment of Army Air Forces for the mission.

At this juncture, the Army began building a case for the extension of organic aviation based on evidence from sources in the various battle areas and on firm requests from theater commander.

With this information as a backup, the Army asked that five light planes be added to the equipment of each infantry, airborne, armored, cavalry and mountain division and renewed the recommendation that two be assigned to each separate reconnaissance squadron (mechanized).

The case finally went to the high command and the terms of the agreement provided six instead of five additional light planes for each infantry, airborne and mountain division; nine to each armored division; seven to each cavalry division; two to each cavalry squadron, separate tank battalion and tank destroyer battalion; one to each separate engineer battalion; two to each cavalry group and tank destroyer group. The airplanes were to be L-4s and L-5s, since more suitable types had not yet been produced.

WORLD WAR II ENDS

On 14 August 1945, while the

program was being set up, the war came to an end. At the close of the war the Army had 1,600 single-engine aircraft, either the L-4 or the slightly larger L-5 by Stinson.

The post-war period saw a reduction in the number of Army aircraft in service, but distribution was on a much broader basis. In 1947, aircraft became organic to all the combat arms and to a few technical services. Officers from these branches were sent to school for pilot training. It was also during this period that serious attention was given to the development of the helicopter program and special emphasis was placed on making all Army aviators rotary-wing qualified.

Coincident with the expansion of aircraft within the Army were efforts to find aircraft more suitable to Army needs. Up to this time, the only aircraft flown by Army pilots were the Cub, or L-4 which was underpowered or the L-5 which was too heavy.

The first aircraft to be built according to strictly Army specifications was the L-15, but this aircraft did not prove satisfactory in all of its field tests. The L-16, a military version of the Aeronca Chieftan, was an interim model and in 1950, the Army finally adopted the Cessna L-19 as its observation airplane. Utility, command and cargo aircraft were added later.

Rotary-wing aircraft also assumed a permanent place in Army Aviation with procurement of reconnaissance, utility and cargo helicopters. The U. S. Army Aviation Board is charged with the mission of testing all



Army helicopters ferry U. N. troops from ship to Korean mainland.

proposed new aircraft and equipment before it is adopted by Army Aviation.

KOREAN EVACUATION

Army Aviation and the helicopter came of age together in the Korean struggle. One medical group alone (the 30th) with only 18 two-place helicopters evacuated over 20,000 casualties during the war. There were only two cargo helicopter companies available in Korea, the 6th and 13th, and with their 21 helicopters they proved themselves invaluable in evacuating wounded and supplying units on the front.

Since its inception, Army Aviation has been organized into small sections, each dependent on the parent unit for administrative and logistical support. The same organization prevailed after aircraft became organic to other branches of the Army. The number of aircraft assigned per division was increased and this expansion created problems that had to be solved. To meet this need, a provisional aviation company was formed during the

Korean conflict.

This company was designed to be completely self-supporting. It was organized into a headquarters group, a base flight, and three lettered flights. The headquarters group was the command element and included maintenance, supply, transportation, and communications sections and performed all administrative functions. Each of the lettered flights supported one of the Infantry regiments in the division when that regiment was on the front line; otherwise it functioned as part of the base flight.

The base flight, commanded by the operations officer, supported Division Headquarters and Division Artillery, and flew missions other than those handled by the lettered flights, which were requested by division units. Grouping all of the division aircraft under one centralized command and assigning missions as they were requested insured stricter adherence to the principles of employment, and yet maintained a higher degree of flexibility with-

in the division than had previously existed.

One feature that went far to make aircraft more available was the establishment of a maintenance "dock". This system, similar to the one used by the Air Force, so drastically reduced the number of hours necessary for periodic inspections that very seldom was more than one aircraft in for inspection at any time.

With this type of an organization, an aircraft could be kept in the air over each regimental area 24 hours a day. Each aircraft carried sufficient radio equipment to maintain constant communication with the fire support coordination center and to also function as a radio-relay unit for stations with the regimental net.

The Army emerged from the Korean War with the realization that Army Aviation possessed the capability of revolutionizing many of the techniques of tactical employment.

Following the war in Korea, the Army did not allow organic aviation to languish, but went ahead full speed in providing the mobility demanded by atomic warfare.

PROGRAM EXPANDS

The growth and extended use of Army aircraft necessitated expansion of the aviation program. In September, 1954, the

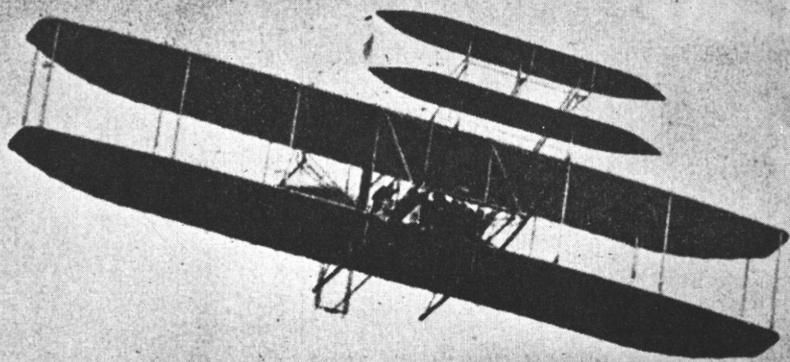
U. S. Army Aviation School moved from Fort Sill, Oklahoma, to Fort Rucker, Alabama. This extended program was continued until July, 1956, when Army Aviation took over from the Air Force all basic training programs. For the first time in history, the complete training of Army aviators and mechanics came under full control of the Army.

In peacetime, Army Aviation has displayed the same courage and skill that brought recognition from the highest command in war. In June, 1956, when two commercial airliners collided and fell into the Grand Canyon, Army Aviation gained worldwide attention in flying helicopters into the canyon in rescue operations.

That same year saw the U. S. Army Aviation Board set numerous helicopter flight records and complete the first nonstop coast-to-coast flight of an H-21, a feat that also turned the eyes of the world on Army Aviation.

Army Aviation, which was the dream of a few Army officers a short 15 years ago, is the fastest expanding field in the military services and well it deserves such a place. Most of that 15 years has been spent fighting for its very existence. While struggling and between struggles it accomplished the mission with a distinction that assures its place in a modern fighting force.

Wright brothers' flight that sold aviation to Army



Prelude to Fifty Years of Flight

John S. Maltrotti

Just fifty years ago the U. S. Army decided once and for all that it needed an airplane to fulfill its mission. The Signal Corps set up a minimum list of specifications and invited the citizens to submit bids for a contract. The Wright Brothers' entry more than met the specifications to win the contract and a recurrent dream of mankind became a reality.

Historically, the dream had been flavored with anxiety. In

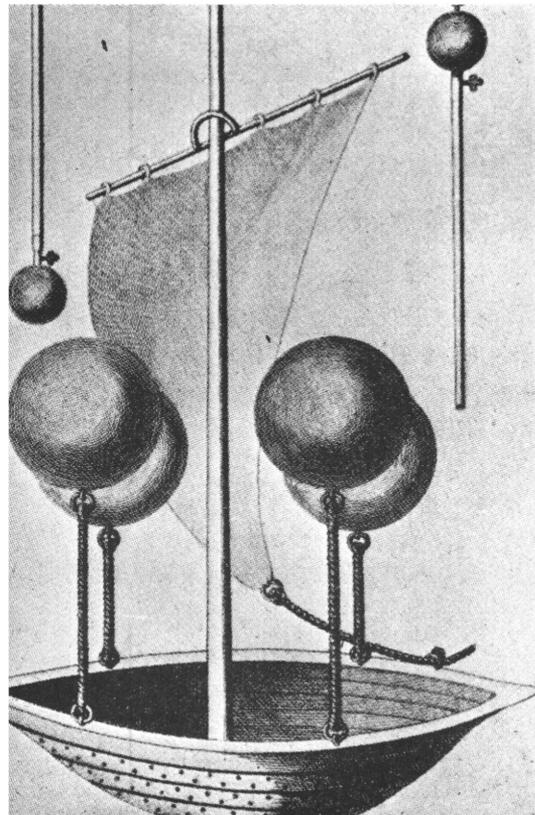
the year 1670 Father Francesco de Lana, an Italian Jesuit, worked up a rather logical idea for an aircraft. The plans on his drawing board called for the construction of four large copper spheres with paper thin walls. He intended to pump the air from the copper spheres figuring, sensibly enough, that the vacuum balls would then rise like an air bubble in a bottle of oil. Then from the spheres he would suspend a rowboat fitted with a sail for navigation from place to place.

In the midst of his research it suddenly struck Father de Lana that this flying machine might lead to much unnecessary destruction and bloodshed. He brooded about this for a while and then reluctantly put aside

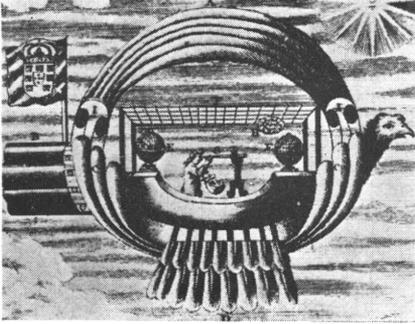
his work, writing "Where is the man who can fail to see that no city would be proof against surprise, when the ship could at any time be steered over its squares, or even over the courtyards of dwelling houses, and brought to earth for the landing of its crew? . . . Iron weights could be hurled to wreck ships at sea, or they could be set on fire by fire-balls and bombs; nor ships alone, but houses, fortresses and cities could be destroyed, with the certainty that the airship could come to no harm as the missiles could be hurled from a vast height." Fortunately for Father de Lana and his people no one else had either the plans or the know-how to build an airship of war.

Some years later in 1709, Father Bartolomeo Gusmao of Portugal, also a Jesuit (apparently they were the only aeronautical engineers of the time) escaped from Lisbon after he was charged with having "devised a contrivance from which destruction and death would be hurled upon the cities of Christian man." The accounts differ, but there are some who claim he flew his machine (see illustration) around the Lisbon square several times, while the citizenry and the King of Portugal himself looked on enchanted. At any rate, Father Gusmao had managed to induce the King to put up funds for the research project which in itself was something

De Lana's Airship



John S. Maltrotti is a Publications Writer on the staff of the U. S. ARMY AVIATION DIGEST. Views expressed in this article are the author's and are not necessarily those of the Department of the Army or of the U. S. Army Aviation School. — The Editor



Gusmao's Flying Ship

of a milestone in the history of aeronautics.

BALLOON INVENTED

Though men worried about the ultimate employment of aerial machines, nevertheless when the Montgolfier brothers invented the balloon in 1783, it was almost immediately made organic to the French ground forces. Gerond de Villette, a friend of the first aeronauts, put what must have occurred to many in a letter to the *Journal of Paris*, "At once I was convinced that this machine, although a somewhat expensive one, might be very useful in war to enable one to discover the position of the enemy, his maneuvers and his marches . . ."

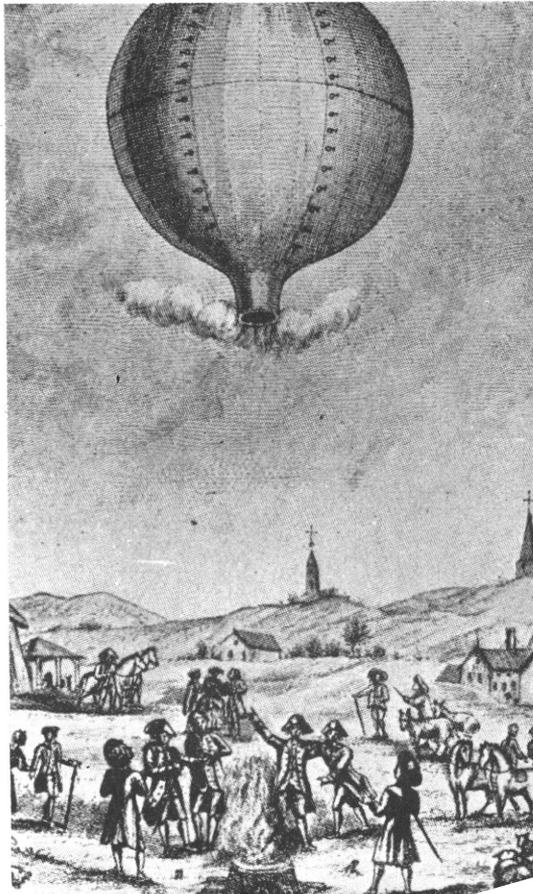
At the battle of Maubeuge on June 2, 1794, the French sent up the world's first aerial observation balloon, *L'Entreprenant*, to observe the Austrian earthworks and gun emplacements. In a few days, the Austrians brought up artillery to blast this French intelligence agent out of the sky, but the French aerialist complicated the problem of the Austrian gunners by towing the balloon from place to place when-

ever the shells began to burst at close range.

BALLOON RAID ON VENICE

Another first came about a half century later, in 1849, when the Austrians decided to make an air raid against Venice. They had long used balloons for reconnaissance, but now they asked: why not bomb the enemy? Several thousand small balloons were assembled, 30 pound bombs attached to each, and they were sent on their way, but as in the Japanese attempt during World War II, few fell on the target and there were no Venetian casualties. On the contrary, the

Montgolfier Balloon



wind shifted once and blew the balloons back over the launchers, causing, it is said, much concern among the Austrian soldiers.

At the outbreak of the Civil War, Thaddeus Lowe, well known aerialist of his day, demonstrated to President Lincoln the advantage of a balloon for observation by making an ascent over the grounds of the Smithsonian Institution. He reported the scene to Mr. Lincoln via a telegraph wire from the basket direct to the White House; the President was immediately convinced, and directed General Winfield Scott, head of the Union armies, to employ Lowe.

Lowe made many ascents to observe the enemy and on at least one occasion (Sept 24, 1861) he directed artillery fire from Fort Corcoran, Virginia, to the Confederate positions near Falls Church—the first such recorded adjustment of artillery fire.

SILK DRESSES USED

The Confederate Army wished to match the Union balloon with one of its own, but had little silk for fabric. The order went out to scour the land for the scarce material and each southern lady responded with a silk dress from her closet. The Confederates then put together a gayly colored patchwork of a balloon and sent it aloft to peer down at the enemy.

Alas, the unsentimental Yankee quickly captured the balloon and the last silk dress was taken from the ladies of the Confederacy. As General James Longstreet remarked in his memoirs, somewhat bitterly, "this capture

was the meanest trick of the war and one I have never yet forgiven."

After the Civil War the Army's interest in military aircraft waned. It was admitted that a balloon was of some value, but it was vulnerable and not very maneuverable and, anyway, it was a time of prolonged peace. Men everywhere were experimenting with powered heavier-than-air flight with little success. However, one of them, Dr. Samuel Pierpont Langley, came extremely close, so close that even today his failure is a debatable point in some quarters.

MODEL PLANE LAUNCHED

Dr. Langley was a brilliant scientist and the Secretary of the Smithsonian Institution. He had become interested in the problems of flight some years previous. On a bright spring day in May, 1896, he launched a quarter size model airplane from a catapult over the Potomac river; it soared aloft and swung about in easy circles, covering over a half mile and when its fuel was gone, descended gently to the water.

Since the Spanish American war was imminent, Congress appropriated funds to enable Dr. Langley to continue his experiments. After several years of painstaking work he completed a full sized model and on October 7, 1903, launched it from a catapult floating on the Potomac. Unfortunately, the launching gear failed and the aircraft dove immediately into the river.

The machine was recovered and repaired, and on December 8, 1903, just nine days before Kitty Hawk, he set it up again

for launching. A report of the event was made to the Secretary of War by the Board of Ordnance and Fortification:

" . . . between 4 and 5 P.M., another attempt at a trial was made, this time at the junction of the Anacostia with the Potomac, just below Washington Barracks . . . The launching car was released at 4:45 P.M., being pointed up the Anacostia towards the Navy Yard . . . The car was set in motion and the propellers revolved rapidly, the engine working perfectly, but there was something wrong with the launching. The rear guy-post seemed to drag, bringing the rudder down on the launching ways, and a crashing, rending sound, followed by the collapse of the rear wings, showed that the machine had been wrecked in the launching, just how, it was impossible for me to see.

"The fact remains that the rear wings and rudder were wrecked before the machine was free of the ways. Their collapse deprived the machine of its support in the rear, and it consequently reared up in the front under the action of the motor, assumed a vertical position, and then toppled over to the rear, falling into the water a few feet in front of the boat."

Public ridicule now forced Congress to withhold any more funds for this "useless quest" for human flight and Dr. Lang-

ley discontinued his labors, broken hearted and bitter.

WRIGHT BROTHERS SUCCEED

Nevertheless, just nine days later the Wright Brothers made the first powered flight in the history of the world at Kitty Hawk, N. C. Unfortunately, the Langley fiasco had created a climate of skepticism and when they offered to Congress, "all the scientific and practical information we have accumulated in these years of experimenting, together with a license to use our patents," they stirred little reaction except disbelief.

Rebuffed by our government, the Wrights were negotiating with the French government when the imaginative Teddy Roosevelt saw the advantage of this new machine to the United States Army and directed Secretary of War Taft to look into the Wright's claims.

In December 1907 the Signal Corps advertised for bids calling for an airplane that would do at least 36 mph, carry two people and remain aloft at least one hour. No other airplane approached these specifications except the Wright entry. The Signal Corps gave them the go ahead and the United States Army took possession of its first military airplane, the Wright "A" Flyer, granddaddy of all the world's military aircraft.

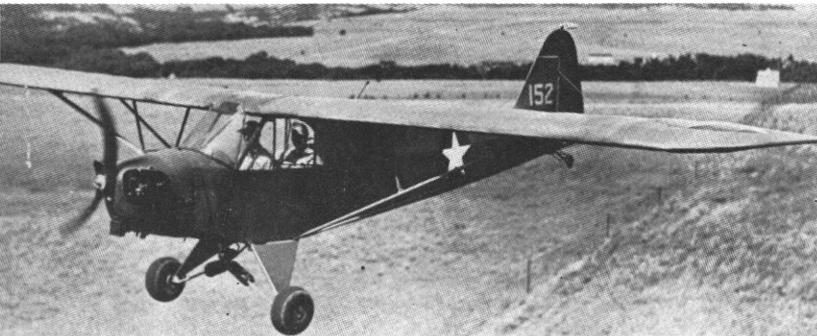
Pictorial Review of Army Aircraft



L-2



L-3B



L-4



L-11



L-13



L-16



L-17

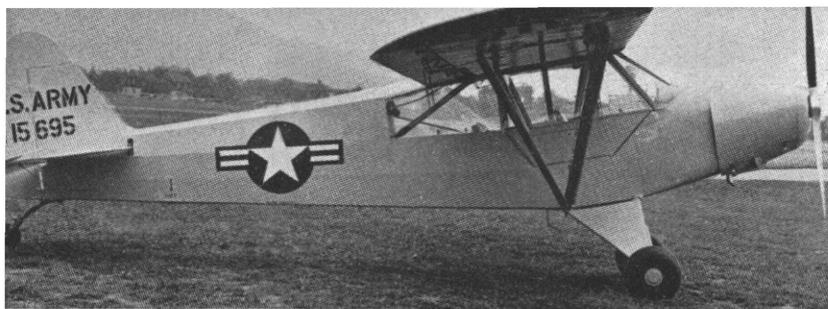
L-19



L-20

L-23D





L-21

YL-15



YL-24



YL-26



U-1A

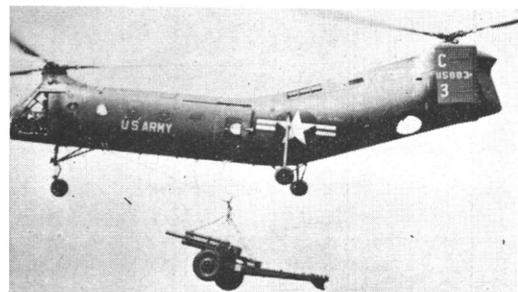




H-13



H-19



H-21



H-23



H-25



H-34



H-37



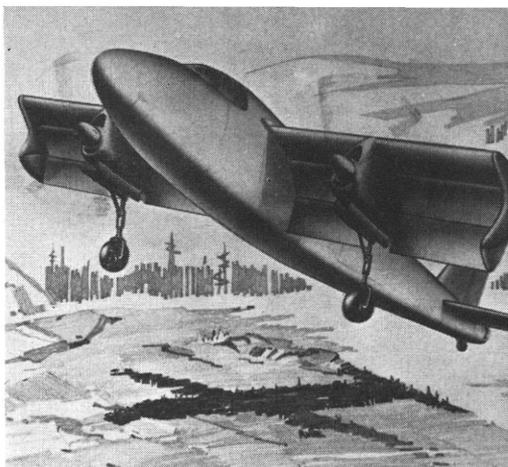
XH-40

*Turn the page
for a glance at
the future*



Photo courtesy De Havilland

DHC-4 Caribou



Ryan "Vertiplane"



Bell XV-3

Photo courtesy Bell

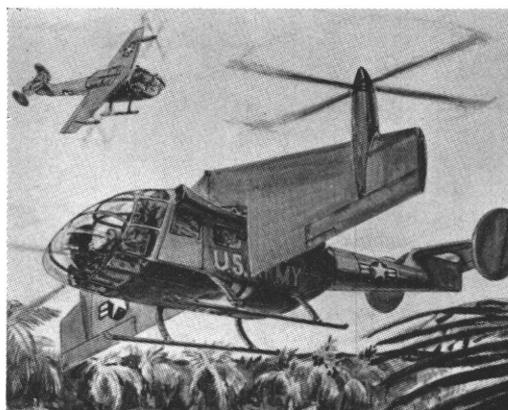
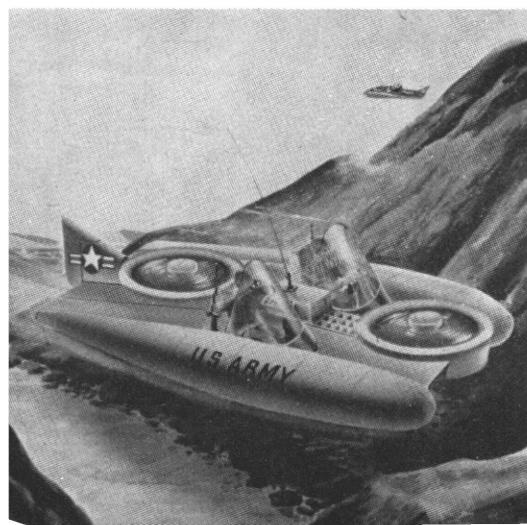


Illustration courtesy Vertol

Vertol Tilt Wing VTOL

Aerial Jeep

CUBS IN COMBAT

Brigadier General Carl I. Hutton, USA

The following are extracts from a memoir entitled "An Armored Artillery Commander," written specifically to be placed in the Artillery School Library, Fort Sill, Oklahoma. They are perhaps largely of academic interest, but they do pertain to one man's recollections of, and opinions about, the operations of Army airplanes in combat. We have too little of such material.

Every war has its own circumstances. The Western European campaigns in World War II were fought against an enemy who was heavily engaged on two other land fronts and who had suffered severe defeats on both. He was no longer a first class fighting power. General lessons about combat must be tempered with knowledge of the particular situation.—Author.

14TH ARMORED FA BATTALION—1944

June 14 marked the entry into combat of our air OPs. These had been on the Division Artillery airstrip since they flew across the channel in formation, guided by an Air Force airplane. Since there had been fairly low clouds the day of the movement to Carentan, somebody at the division artillery airstrip decided our airplanes could not join us. This was one of the characteristic mistakes which occurs when the airplanes are under the con-

trol of someone other than the man who is going to use them.

If the airplanes had been with us for the second attack on the afternoon of the thirteenth, it might have been possible to have detected any rearward movement of the enemy after he had felt the full force of the attack. On the fourteenth the air observers had fine shooting, especially since the Germans were not yet accustomed to seeing the airplanes in the air, and measuring

their effectiveness by the artillery fire which fell upon them when they exposed themselves. At any rate, from this time on I struggled to have my airplanes with me, although not always with success . . .

June 17: The air OPs had proven their effectiveness and their ability to observe counter-battery fire, as well as to detect other targets in the Bocage country . . .

July 3: (Diary Entry) "Thank God for the Cubs. Keep Jerry down."

July 1-18: (Caumont) Our air OPs were again proving their worth. The air section located their landing strip perhaps a mile in rear of the command post. Because of the conformation of the front, however, (we occupied the front left-hand corner of a sharp salient) they were not very far from the enemy. In spite of low approaches which they made to the landing field, they were occasionally shelled. On one occasion, Lieutenant Fein and Sergeant Pechar, becoming irritated at this discourtesy, took off under shell fire and did some fine shooting back. The good which the airplanes did was not limited to the negative benefit of holding down hostile

fire. Again and again they proved their worth in locating hostile guns. At dusk, this was especially easy since the flashes of the guns were very distinct . . .

July 4: I flew an air mission over the front to check on the work of the observers. After seeing the enemy side of the lines from the air, I tended to put more faith than ever in the air OPs. They were really looking right down the enemy's throat. No big movement could have taken place close to the enemy lines in the daytime without it being detected from the air. After repeated missions over the same front, the observers became so familiar with the front that adjustments on targets were frequently unnecessary. They could tell the coordinates with remarkable exactness . . .

July 5: (Diary Entry) "Good air observation from 2200 to 2300 . . ."

July 18-19: An incident during the relief from the Caumont front convinced me that my demands for full control of my airplanes were justified. The whole relief was an echeloned affair, with the 14th Field Artillery moving out last. Division artillery moved out during the day



Brigadier General Carl I. Hutton was Commandant of the U. S. Army Aviation School from July, 1954 until June, 1957. At present he is en route to his new assignment in Germany as 8th Inf Div Arty Commander. In March, 1944, he commanded the 14th Armored Field Arty Bn and in August, 1944, assumed command of the 2d Armored Div Arty where he remained until Sept., 1946. It is this period of combat in Europe about which he writes in this article, which first appeared in the March, 1955, issue of the ARMY AVIATION DIGEST. Views expressed in this article are the author's and are not necessarily those of the Department of the Army or of the U. S. Army Aviation School.—The Editor

and the air officer took my air section with him. Although this was simply a misunderstanding, it demonstrated the possibility of a misunderstanding, and I of course did not fail to point out to Colonel Roberts that I did not like it. He agreed, and always from then until his death, made a point of letting me have my own airplanes . . .

July 25: (St Lo Breakthrough) The air OPs were to operate independently under each battalion commander since we were again limited by the lack of interchangeability of the radios . . .

July 26-August 1: (Tessy-Sur-Vire) The air OPs in this fight gave us about the only real observed fire we had. The forward observers were hemmed in by the trees and hedgerows and could not see beyond their immediate front. The German artillery was behind the ridge and with observation all along the line of our attack. The air observers did a fine job, in spite of almost constant sniping at them by 88mm anti-aircraft guns.

On one occasion we managed to save General Rose, who was pinned down by artillery fire, by the efforts of Lieutenant Fein and Sergeant Pechar. Toward dusk on this day, they were having wonderful shooting at the hostile artillery, but they reported they were about out of gasoline, and would have to come down. Of course, I told them to stay up and keep up the shooting. Finally, it got too dark for them to see, and they headed for the airstrip. They ran out of gasoline on their final approach, and had to make a night forced landing.

During part of the battle,

Captain Dyson was acting as observer with the 1st Battalion, 66th. He switched his radio to the battalion air channel, and by talking back and forth with the air observer, managed to get effective fire on his front. As far as I know, this was the first time this obvious and effective coordination between the air OPs and forward observers was used. It was an excellent scheme.

It had the disadvantage of focusing the attention of the air observer on this small part of the front to the exclusion of the others. It worked out so well that we soon started the same system with all of our observers, under the control of the S-3, to prevent one observer from hogging all of the observation . . .

2D ARMORED DIVISION ARTILLERY

August 9: Major Gordon, my air officer, and a division observer were injured when their L-5 flew through the tops of some trees in an attempted take-off. I appointed Captain Mahon, an Air Force rated observer, to be air officer. Although this was unusual to have a non-pilot as air officer, I never had occasion to regret the decision . . . Mahon always did a very fine job . . .

August 10-11: One of the 62d Field Artillery light airplanes, in flying back to its former area to pick up some equipment left there, made the mistake of repeating a route which he had flown the day before. He disappeared and, only later, we learned that he had been shot down by light anti-aircraft fire from the ground. He survived and was liberated in a hospital in Paris . . .

August 1944: There were very few changes in policies. One,

however, I made in regard to the air OPs. I was willing to have the unit air sections bed down on the division artillery airstrip, but I preferred that the battalion commanders assume full control. At any rate, whether they were on my strip or not, the battalion commanders were to be responsible for them. As habits developed, the 14th and 65th kept their sections on a separate field.

Division artillery and the 92d habitually kept their airplanes on the division artillery strip. This arrangement arose quite naturally, since the poker players were pretty much concentrated in these two air sections. The 78th moved back and forth, sometimes with us and sometimes on unit strips. In spite of all the talk which was and is going on about "centralized control" of the airplanes, I still believe that they are furnished to the battalion commander to assist him in the accomplishment of his mission, and they should not be taken from him without cogent reasons.

The system which we finally developed was about as follows: The 14th and 65th habitually supported CC "A", and they pooled their four airplanes to assure full time air observation. The 78th and 62d habitually supported CC "B" and they pooled their four airplanes. Division artillery, the 92d, and the 258th pooled their airplanes for general support missions. When the situation stabilized, the division artillery air officer made out a schedule of hourly flights, among all of the airplanes in the artillery. The aircraft relieved each other in the air on these mis-

sions, and therefore it made no difference whether they were on the same strip or not . . .

August 24: (Elbeuf) During this day, I was attempting to observe from the air, and I could see and hear the shells bursting among the tanks below me. But the artillery doing the shooting was well hidden, or at least I could not pick it up . . .

August 26: (Seine) A massed group of about 400 German vehicles was detected by Lieutenant Moyer from an air OP. They were hub to hub, waiting their turn to be ferried over the river. Moyer begged, prayed, cursed, and screamed through the whole gamut of the fire request lexicon. It didn't do any good since they were out of our range and in the Canadian sector besides. We had to tell Moyer to come down to keep him from having apoplexy . . .

September 1: (Belgium) The 14th Field Artillery supported that attack on this column, and all of the while there was a hue and cry, "Where are the Cubs?" There was a high wind on the ground, and above the tree tops the velocity must have reached sixty miles per hour. The air OPs were valiantly struggling (against the wind) to get into the fight, when one of them discovered what he estimated as a battalion of German infantry attempting to escape to the northeast. The 14th swung around 3200 mils and took this new target under fire. The Germans were caught in the open, and suffered terrible losses under this accurately directed fire . . .

September 1944: (Belgium) Again on the 7th we had to wait

for gasoline. The Reconnaissance Battalion, however, had patrols out as far as twenty miles to our front. The division artillery air OPs were working with these patrols. Captain Mahon as observer and Sergeant Welsh as pilot on this work had an experience which changed rapidly from fun to ludicrousness. They were working with an armored car section when they discovered about a company of enemy infantry attempting to seek cover in a woods. Mahon radioed this information to the armored cars, who immediately started forward to round up the catch. It became apparent to Mahon that the Germans would escape into the woods, and probably for good, unless they were delayed.

He therefore staged a strafing attack, firing at the troops on the ground with his submachine gun, and even dropping hand grenades in their midst. This was fun and very exciting, and the Germans stopped at each pass to hit the ground or to fire back. On one pass, however, somebody, either Mahon or the Germans, shot the propeller off the Cub, and the situation rapidly deteriorated out of the realm of strategic air warfare. The only field available for the forced landing was the one which the Germans were dominating through occupation. Welsh made the landing. Just as the Germans were descending upon them in order to exact their pound of flesh, the armored cars arrived and saved the day for the allied nations . . .

September 16: (Holland) The air OPs reported more enemy artillery in the area than they had yet seen . . .

October 2: (Ubach, Germany) We were given the mission of counter-antiaircraft fire during the preparation bombing by the medium bombers. Air OPs were to fly surveillance missions, taking under fire any antiaircraft guns which opened up . . .

October 6: Despite the heavy flak, our air OPs were doing a wonderful job, especially in counterbattery, since their command of the terrain ruined all defilade . . .

October-November: Our air OPs received concentrated and accurate 88mm flak constantly in this area, yet we did not lose a single airplane. There was a flak battery to the north of us, in prolongation of the Geilenkirchen-Ubach Road. When we crossed this road going east or west, we could expect flak. All of the pilots soon became accustomed to the gauntlet and they would approach it doing something different—diving, climbing, twisting, or turning. When the weather was good, the observers could see Cologne and Aachen, and if they could fly at all, they could see all of the enemy artillery on our front. This artillery was well dug in and very hard to silence.

Adjustments had been made repeatedly on most of the positions, and the observers would call in something like this: "That 095362 battery just fired again. Do you want to do anything about it?" Depending upon the status of ammunition expenditure, we might or might not engage the target. Invariably, if we did shoot at it, the battery would stop firing while the gun crews returned to their shelters. Therefore, the results of such

shooting were largely negative.

October 16: (Ubach) Captain Stone was our liaison officer from XIX Corps Artillery. He was an ambitious officer, and every day or two he would return to Corps, and using one of their airplanes, he would fly a mission in our sector. On the 16th, Captain Stone was flying such a mission in an L-5 with Major Hatch, XIX Corps Artillery air officer, as pilot. The airplane was shot down by a flight of 4 ME 109s, which came in on the deck and made one upward pass, and both Hatch and Stone were killed. This was the type of fighter attack which the Luftwaffe used extensively later on, with some results . . .

November 16: (Seigfried Line) In preparation for the attack, our air OPs took oblique photographs of the terrain. These were reproduced in quantity and distributed in sufficient numbers to provide one set of photos for each platoon leader. The theory was that the oblique could be marked and used as a map. I do not know whether the platoon leaders actually used these photos, but the idea is a good one to be remembered for future use, especially in poorly mapped country . . .

December 23: (Bulge) At about 1600, Captain Mahon, in an air OP, was investigating the Leignon-Dinant area when he discovered German armor in some woods southwest of the hamlet of Liroux. A British 11th Armored Division reconnaissance troop had an outpost about 1,000 yards from the Germans, and along the Ciney-Dinant Road. The air OP landed by this patrol and warned them of

the presence of the enemy.

December 25: (Bulge) The fighting around Celles was naturally somewhat confusing. Lieutenant Moyer, as observer in an air OP, was observing a mission in this area. He was adjusting fire on the surrounded reconnaissance and artillery elements. He could see our tanks beyond the target. When the Typhoons peeled off for their attack, Moyer and Welsh assumed they were attacking our tanks instead of the enemy. They decided to fly in front of the Typhoons in order to divert the attack. They had done this several other times, and thus prevented misdirected attacks by our fighter-bombers upon our own people. This time, much to their surprise, they found themselves in the midst of quite an air-ground battle. The enemy was firing 20mm's, and the Typhoons were firing rockets. Our air OP retired in confusion to look over the situation and Moyer admitted for once the Air Force had been right while the air OP had been wrong . . .

1945

March 2: (Germany) A counterattack in force was reported coming across the Erft Canal in the Grevembroich area. This was miles behind our leading elements, and we sent an air OP back to investigate. It happened that Lieutenants Kistler and Moyer were the crew of this air OP, and they had an opportunity to indulge their specialty of interposing themselves between our fighter-bombers in the air and our troops on the ground. According to Moyer, the P-47s knocked out five enemy tanks

and six of ours. A picture of this action appeared in an issue of LIFE with the caption that an American column shown on fire had been destroyed by the enemy. They were, in fact, destroyed by our own fighter-bombers . . .

March: (Rhine River) The Luftwaffe, in this area for the first time, made an organized attack upon our air OPs. Although I cannot verify the figure, I remember eleven as the number of air OPs which were shot down in Ninth US Army by these attacks in less than a week. Compared with the number of light aircraft which were concentrated in the area, this number is insignificant. One of our own aircraft was shot down, wounding both the pilot and the observer, and we had an accurate description of the method of attack. Lieutenant Reid, pilot, and Lieutenant Middleton, observer, were on a routine mission, patrolling the front of the 113th Cavalry Group on March 17th. The first they knew of their being attacked was when 20mm tracers struck their Cub, coming from below and behind. Reid proceeded to make a crash landing. Four ME 109s had made the pass from across the Rhine at about fifty feet altitude. After the crash, the enemy fighters strafed the crashed plane on the ground. Two of these fighters were shot down by our AA fire while trying to escape.

An isolated attack of this kind could be attributed to chance. In connection with the other attacks along the Ninth Army Front, however, the element of chance in such precise attacks

can be disregarded. It is obvious that the fighters were directed to their target by some control method which enabled them to cross the Rhine at very low altitude and at the exact time which would allow them to make the attack from below and to the rear.

Any number of methods could be employed effectively for arrangement, from radar direction to simple visual observation by a concealed observer on the ground, and radio contact with the fighter flight in the air. The boldness and the unconcern of the air OP personnel, growing out of the months of safety, contributed to the success of the enemy scheme. Variations of pattern, course, altitude, and speed would lessen the chance of a fighter attack being able to stalk the flight without being seen . . .

March 31: (Across the Rhine) We began to have a seige of losses in our air OPs. We were many miles ahead of other troops in our vicinity, and the Cubs had no protection except when they were immediately over the columns. The enemy fighters downed one almost every day for a while. The exploit of Lieutenant Emerick and Captain Mahon near Ahlen demonstrates the safety of the Cub-type airplane. They were attacked by twelve ME 109s. One flight made a pass at them on the way down, and when they arrived on the deck, the twelve were coming at them from the rear in line abreast.

If they continued straight ahead, the flight immediately in rear would get a shot at them, while if they turned in either

direction they would come under fire of the flights to either side. They were flying just above some small pine trees and Emerick dipped his wing into the trees. The airplane snapped over and crashed on its back. Emerick and Mahon scrambled out and hid in an irrigation ditch while the fighters strafed the crashed plane. After the fighters left, they recovered their radio and walked across country a mile to join the column. On the way, incidentally, they picked up a German machine gun crew as prisoners.

This escape was partially miraculous, and partially attributable to the L-4. It was simple, light, and slow. There were no gadgets for the pilot to work and no problems of speed control such as there would have been if the pilot had had to work flaps. The terminal velocity of its dive was low enough so that there was no problem of killing off a lot of extra air speed near the ground. Such an escape in an L-5 would have been almost impossible. As it was, Emerick and Mahon were flying again the next day, although Mahon did complain of a stiff neck . . .

April 2: (Elbe River) The weather prevented observation by either air or ground OPs. Although on the surface the day appeared to be clear, actually

there was a strong inversion with the usual accompanying haze and our observation was simply ineffective. It was a day of frustration and desperation. The air OPs flew out farther and farther in efforts to suppress the hostile fire, but they did not succeed . . .

LESSONS OF WAR

Therefore, the first lesson of World War II was that our artillery doctrines are sound. The fire direction center, the air OPs, the forward observers, and the plans of massing artillery fire were developed before the war step by step with the development of communication equipment . . .

It is a foregone conclusion that air observation will always be necessary on the battlefield. The air OPs of the last war did a remarkable job and an air OP will be required in the next war. If antiaircraft developments force the abandonment of the commercial-type light aircraft, some other solutions will be required. The ultimate in this would be a standard fighter, but it is hoped that this solution will not be necessary since it will remove the very essential close control and coordination of employment by the battalion commander . . .

P R O J E C T



L O N G A R M

Lt Colonel Jack W. Ruby, CE

THE FIRST higher performance test unit in the history of Army Aviation has been established at the U. S. Army Aviation Center.

Three higher performance Army observation aircraft on loan from the Air Force are to be used as the test medium. The over-all purpose of the test unit, code name "Project LONG ARM", is to determine the organization, techniques and procedures for higher performance observation aircraft within the

U. S. Army. The use of higher performance aircraft would permit the Army to extend its air reconnaissance, observation and adjustment of artillery fire to meet the requirements of atomic warfare.

Immediate test objectives are: the determination of training and logistic problems incident to the introduction of higher performance observation aircraft into the Army system; development of the most effective organization for such aircraft; development and testing of operational procedures; precise evaluation of higher performance aircraft vulnerability and survival probability to determine the relative observation capabilities at various altitudes and

Lt. Colonel Jack W. Ruby, CE, is Deputy Director of "Project LONG ARM." Views expressed in this article are the author's and are not necessarily those of the Department of the Army or of the U. S. Army Aviation School.—The Editor



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speeds, and to determine desirable performance characteristics for an Army higher performance observation aircraft.

Initial considerations in organizing the unit focused on the necessity for providing transition and other specialized training for pilots and maintenance personnel; the establishment of new supply channels and procedures; and the development of adequate maintenance support. These matters are currently being resolved while the unit is still at Fort Rucker in its organization and training phase.

TEST PLAN

The plan of test, formulated at the U. S. Army Aviation School and approved by Continental Army Command and Department of the Army, calls for the unit to enter its second, or operational, phase on or about 1 October 1957. At that time the unit will move, with full equipment, to the U. S. Army Artillery & Guided Missile School, Fort Sill, Okla.; the U. S. Army

Armored School, Fort Knox, Ky.; and the U. S. Army Infantry School, Fort Benning, Ga.

The unit will remain at each of these installations for periods of from three to five weeks conducting a variety of missions under varying conditions in support of the combat arms. These test missions will include the detection, location and identification of targets for Army weapons, adjustment and surveillance of fire, damage assessment, and obtaining information of the enemy by means of visual observation.

The unit will then return to Fort Rucker for composite evaluation of individual tests, and reorganization in preparation for participation in field exercises during 1958.

IMPORTANCE OF TESTS

The atmosphere in which these tests will be conducted can best be explained by quoting a portion of a letter written during the test unit's formative period by Brig. Gen. Carl I. Hutton, Commandant, The U. S. Army Aviation School, and Commanding General of Fort Rucker, who stated,

"The importance of the Army's test of higher performance Army observation aircraft cannot be overemphasized. The success of this test will determine to a large measure whether or not the Army will be allowed to operate this type aircraft in the future."

The Gray Hair Department



FROM THE INITIATION of aviation in the Army in 1908, until the following accident reports were compiled in 1914, there were 11 fatal accidents, resulting in the death of 12 commissioned officers, one noncommissioned officer, and one civilian. Of those killed, nine were pilots—eight military, one civilian—and five passengers.

In those early days, the philosophy of Army flying would appear to have been quite similar to that of present day Army Aviation. Although the terminology is out of date, the prob-

lem of accident investigation was exactly what it is today. In some cases the Accident Boards seem to ask, "How could he have done it?" In others, the question is: "What happened?"

The following accident reports are presented through the courtesy of the Directorate of Flying Safety Research, Norton Air Force Base, California. Unfortunately space does not permit publishing the report in its entirety and accidents #5, 8 and 9 were omitted, along with charts and part of the summary pertaining to the charts. However,

Lieutenant Colonel William C. Bowen, Jr., Transportation Corps, the Senior Army Aviator pictured above, is the acting Director of Instruction, the U. S. Army Aviation School, Fort Rucker, Ala. He is a graduate of the Liaison Pilots' Course No. 5 at Fort Sill, Okla., in 1942. Earlier that year, he completed the Battery Officers' Course at the Fort Sill Artillery School and returned there in 1951 for the Advanced Officers' Course.

From 1942 to 1944, Colonel Bowen served as Battalion Aviation Officer of the 34th Field Artillery Battalion of the 9th Infantry Division which saw action in North Africa, Sicily and Europe.

the analogy includes the omitted accidents.

ACCIDENT NO. 1

Mr. Orville Wright was flying the original Wright type of machine for acceptance test at Fort Myer, Va., with Lieut T. F. Selfridge as passenger, on September 17, 1908, when one of the propellers broke, the machine being at that time about 75 feet from the ground. The machine side-slipped and nose-dived, striking the ground with such force as to fatally injure Lieut Selfridge and break Mr. Wright's leg. Cause of accident: Breaking of propeller and consequent loss of lift in the machine. Lieut Selfridge's death can in no way be connected with any question of type of machine or skill of pilot.

ACCIDENT NO. 2

Extract from Proceedings of Board of Officers held at San Antonio, Texas, May 10, 1911:

From the evidence given, the Board finds that Lieut Kelly had made a flight of approximately five minutes duration, in a Curtiss bi-plane, at about 7 AM, May 10, 1911, under good atmospheric conditions. As a result of this flight, he met his death.

He had made a not abnormally hard landing. Upon landing at least one and possibly both sides of seat fork were broken at

a point between pilot seat and foot rest. At the same time it appears that one diagonal bamboo brace from front wheel to front elevator was broken, and its mate was bent.

After striking the ground the first time, the machine bounded to a height approximating 10 feet, and gradually rising to about 30 feet until, within about 75 yards of the camp of the Eleventh Infantry, it made a sharp turn to the left, banked up the turning wing, and made an abrupt dive to the ground. Lieut Kelly was thrown clear of the machine to a distance of about 20 feet.

As a result of the first impact with the earth, it is apparent that the pilot lost control of the front elevator and therefore had only partial control of the machine.

It is the unanimous opinion of the Board that the front wheel must have struck an abrupt depression in the ground or some obstacle causing the strain which resulted in the break.

From all the preceding facts, the Board is of the unanimous opinion that the accident was due to the efforts of Lieut Kelly to avoid endangering the occupants of the Eleventh Infantry camp in which endeavor it became necessary for him to make a sharp left turn, which,

From 1944 to 1945, he served as 9th Infantry Division Artillery Aviation Officer. He received his B.S. from the University of Florida in 1946.

He returned to Europe again in 1951 when he became V Corps Artillery Aviation Officer, remaining in that position until 1953. From 1953 to 1954, he commanded the 41st Transportation Battalion (Aircraft Maintenance) in France. Colonel Bowen has logged approximately 2,200 hours in his 15 years of flying and is both rotary- and fixed-wing qualified.

in the crippled condition of the machine, put more strain on the controls than would have been required in a straight away landing. Such straight away landing was impracticable owing to the proximity of the tents.

Probable Cause of Accident: Error in judgment on part of pilot in selecting an unsuitable landing place.

ACCIDENT NO. 3

Extract from Proceedings of Board of Officers held at College Park, Md., June 12, 1912:

That the machine arose from the ground, made a circle of the field, and then flew south a distance of nearly $\frac{1}{2}$ mile, made a turn towards the trees and flew north at a height of about 150 feet. The machine was then pointed down at an angle of about 45 degrees, with the power on, and glided down in this position to a height of about 30 or 35 feet from the ground. Mr. Welsh was then seen to work at his levers and the machine came up to the horizontal position when it seemed to quiver, and the wings appeared as if they were raised up, the ends being from two to three feet higher than the center section. It seemed to pause for a moment and then dove head-first into the ground. The engine was heard to run until the machine struck; then it was enveloped in a cloud of dust. This accident occurred about 6:13 PM.

From all testimony of eye-witnesses and a careful examina-

Views expressed in The Gray Hair Department are not necessarily those of the Department of the Army or of the U. S. Army Aviation School. — The Editor

tion of the machine, the Board is of the opinion that the accident was due to the fact that the operator endeavored to bring the machine upward too suddenly, thus throwing a greater strain upon the front spars than they were able to withstand. The spars broke and the wings collapsed, bending outward and backward. The machine, being relieved of the support of these outer planes, was precipitated to the ground.

Probable Cause of Accident: Error in judgment on part of pilot in gliding with power on and pulling machine up too suddenly.

ACCIDENT NO. 4

Extract from Proceedings of Board of Officers at College Park, Md., October 2, 1912:

Immediately after the accident, the Board proceeded to examine the wrecked machine and upon this examination found that the control wires were all intact. From the testimony of eye-witnesses, the Board is of the opinion that the accident was caused by the aviator misjudging his height from the ground and his failure to bring the machine out of the glide in sufficient time to clear the ground.

Probable Cause of Accident: Error in judgment on part of pilot in not straightening up machine before striking the ground.

ACCIDENT NO. 6

Extract from Proceedings of Board of Officers held at San Diego, Cal., May 10, 1913:

No person actually witnessed the accident. From the testimony and evidence obtainable the Board reached the follow-

ing decision:

Lieutenant Park left the aviation field at North Island approximately 5:20 o'clock AM, May 9, 1913, with the intention of flying to Ascot Park near Los Angeles.

His object in an early start was to avoid strong winds which might arise later in the day.

At 8:30 in the morning a telephone message was received stating that Lieutenant Park had been killed at Olive, California.

The members of the board and the medical officer, Captain M. A. Reasoner at once proceeded to the scene of the accident in an automobile arriving there about 1:00 o'clock PM.

The wreck of the machine and the remains of Lieutenant Park had been removed to Santa Ana, Cal., by direction of the County Coroner, the wreckage being taken to the National Guard Armory, and the body to the undertakers. The wrecked machine was examined by the Board and the body identified by the President of the Board before proceeding to an examination of the scene of the accident.

Lieut Park had landed on a small knoll, the area of the top of which was such that it gave him about a run of 300 feet before he came to the slope which was about 20 degrees. At the bottom of the slope is a ridge or embankment. Beyond the ridge is a small valley or ravine, which is covered with trees. On the opposite side is another equally steep slope to the top of another small hill, beyond which is a flat open valley of about four or five square miles in area. The high barley so retarded the speed

of the machine that it did not rise before reaching the descending slope.

It ran down the slope until it reached the ridge, and striking this undoubtedly bounded into the air. About 50 feet beyond the ridge is a tree or sapling. The machine struck the tree about five feet from the ground at the left end of the engine section. The force of the blow tore away the entire left side of the machine.

It swung around to the right of the tree, landed at a distance of about 100 feet on the right rear wheel. This broke the right panels and caused the machine to turn completely over to the left, as the entire left side of the machine was gone. From the position of the radiator, it had evidently fallen on Lieut Park's head and due to the weight of the engine behind, had crushed it into the ground. The machine had apparently never left the ground until it reached the small ridge above mentioned and then only for a distance of about 50 feet.

Nothing but a perfect landing in the small difficult area could have avoided an accident in alighting.

The Board is of the opinion that the accident was due entirely to the poor judgment of Lieut Park in attempting to rise from such a place.

The knoll was of such a small area and surrounded by such obstacles that it would have been impossible for any machine to have arisen from it. The accident was in no way due to the fault of the machine which was in perfect running condition.

The following features con-

nected with the accident remain inexplicable to the Board:

1. Why Lieut Park did not choose any of the large flat fields in the vicinity in which to land.

2. Why, after landing, he attempted to leave in the direction he did when a glance around him would have shown him its very apparent danger.

3. Why he disregarded instructions received prior to his start to communicate personally with the Commanding Officer in case he landed before reaching his destination.

Probable Cause of Accident:
Poor judgment of pilot.

ACCIDENT NO. 7

Extract from Proceedings of Board of Officers held at Texas City, Texas, July 8, 1913:

That Lieut Loren H. Call left the aviation field at 6:21 AM, July 8, 1913, in aeroplane No. 11, a type C machine, made by the Wright Company, of Dayton, Ohio for the purpose of practicing accurate landing without power. This landing is one of the tests for qualifications as military aviator, and Lieutenant Call left the field with the understanding that Lieut R. C. Kirtland and the crew of the machine would follow him to the smooth ground north of the camp of the Fourth Field Artillery, where he would make the test with Lieut Kirtland as official observer.

The air conditions were quite good at the time he left the field, although there was a slight puffy wind blowing from the north, the anemometer record showing that at 6:45 AM, the wind had a strength of six miles per hour. While flying at an elevation

variously estimated at from 600 to 1200 feet (Lieutenant Call's barograph was broken, the record sheet showing that the needle failed to register at any time during the flight), the plane fell resulting in the instant death of Lieutenant Call and the complete destruction of the aeroplane, at 6:45 AM, July 8, 1913.

From the testimony it appears that the aeroplane assumed a very dangerous angle, with the left wing at least 45 degrees lower than the right; *that Lieutenant Call evidently attempted to straighten out the machine by turning to the left and pointing the nose down;* that the machine then took a very steep angle downward which gradually became a perpendicular drop, and that between 200 and 300 feet from the ground the plane began to turn upside down, at which time the wings collapsed, the plane then falling straight to the ground striking upside down.

There was nothing found to indicate any engine trouble in the air.

Probable Cause of Accident: Stalling and subsequent incorrect use of rudder by pilot. The collapse of the wings is a common result in accidents of this sort and does not necessarily indicate any structural weakness in the machine, but a great increase in pressure due to velocity of fall.

ACCIDENT NO. 10

Extract from Proceedings of Board of Officers held at San Diego, Cal., November 25, 1913:

About 7:00 AM, on the morning of November 24, 1913, Lieu-

tenant Ellington, Chief Instructor, made a short flight in aeroplane No. 14, returning safely to the hangars after perfectly normal flight of some five minutes duration. No trouble had developed either with the engine or machine, except that the engine was heard to miss once or twice while in the air.

Lieut Kelly then made a careful examination of all parts of the machine, at the conclusion of which both he and Lieut Ellington got into the machine for a flight. At this time Lieut Ellington was heard to give Lieut Kelly some final explanations as the correct use of the double throttle, both foot and hand, with which this machine was equipped. After a short flight around the southern part of the island, the machine was noticed apparently returning to the Wright field with the engine missing badly. While still about one mile from the Wright hangars, the machine was brought into a normal gliding angle, and the engine apparently throttled down, though still missing.

It was the opinion of witnesses at this time that it was the intention of the pilot to make a landing, and not attempt to make the Wright field with the missing engine. At the beginning of this glide the machine was probably 200 feet from the ground. The glide continued normal until about 75 feet from the ground, when the angle of glide suddenly steepened into a headlong plunge into the ground. At the moment of striking the ground the machine was about vertical.

In the opinion of the Board, the accident was caused by an inherent tendency in this type of

machine to plunge downward upon any sudden accession of power during a glide.

The Board further believes that such an accession of power took place at the movement of the plunge, or rather just before it. A puff of smoke was observed from the engine by one witness at this instant, giving the appearance of full power having been suddenly turned on, probably accidentally.

All controls of the wrecked machine were intact.

Probable Cause of Accident: Stalling due to remaining too long in air, with missing engine and starting glide.

ACCIDENT NO. 11

Extract from Proceedings of Board of Officers held at San Diego, Cal., February 10, 1914:
Statement of 1st Lt. V. E.

Clark, C. A. C.

Q. Please state to the Board all that you know of the accident to Wright Hydroaeroplane No. 10, yesterday, which resulted in the death of Lt. Post.

A. I was standing near the eastern end of the main hangar watching Post come down. I had watched him from an elevation of probably 2,000 feet, all the way. After he got down below a 1,000 feet, I remember thinking he was pointing down very steeply. From 1,000 feet down to the time the machine collapsed he was spiralling widely and with very little bank. I believe that his gliding angle increased gradually from 1,000 feet down to what I judged to be between 500 and 600 feet, when the machine appeared to me to round over and point practically vertical. At the same

time—that is, as the machine rounded over to the vertical—I saw Post, or a black body which I took to be Post, thrown well forward and out from the machine. Immediately the machine collapsed.

I am not sure that Post was thrown clear before the collapse, but I believe this to be the case. Post's body reached the water while the collapsed machine was still 75 or 100 feet in the air, and his body struck the water at a point which I estimated to be 300 or 400 feet away from the machine, and in the same direction from the machine as the direction of movement of the machine at the time of its dive.

The fact that Lieut Post had descended from an altitude of approximately 12,000 feet to an altitude of 1,000 feet without difficulty, and in a normal manner, as far as can be determined, from the evidence submitted herewith, leads the Board to the opinion that the responsibility for the accident, resulting in the death of Lieut Post, was not due to any known fault or action on the part of Lieut Post.

That although the machine descended from approximately 1,000 feet to approximately 600 feet, at an increasingly steeper angle, ultimately assuming at the latter altitude a vertical, head-down position, the Board cannot believe that this was caused through any fault of the operator, Lieut Post.

The Board is therefore unable to determine the cause, or fix the responsibility for the accident to Wright Hydroaeroplane No. 10, which resulted in the death of Lieut Post.

The Board is finally of the

opinion that the cause of the accident to the Wright Hydroaeroplane No. 10, was due to the machine going into a vertical, head-down position, causing excessive pressure on the planes which resulted in the collapse of some part or parts of the machine.

Probable Cause of Accident: Difficult to determine from the testimony; may have been due to pointing the machine down too steeply, when Lieut Post fell forward from the machine. Immediately afterwards the machine collapsed, probably due to excessive air pressure caused by great velocity of fall.

GENERAL DISCUSSION

From the above extracts it can be inferred that of the 11 accidents occurring, one was caused by the breaking of the propeller (accident #1), one by landing on unsuitable ground (accident #2), one by adverse weather conditions (accident #5), three through bad judgment used by pilots (accidents Nos. 3, 4 and 6), three by stalling (accidents Nos. 7, 8 and 10), and two, cause undetermined, probably stalling. In none of the above accidents is there any record of the controls having failed.

In accident #10, the motor is reported to have been missing; in #9, the motor may have given trouble. In accidents Nos. 3, 7 and 11, collapse of the wings was noted, in the two latter cases collapse was due to excessive air pressure caused by too rapid a descent; in #3, to an unnecessarily great strain on the wings in pulling up the heavily loaded machine too abruptly.

Since 1911 a record of flights

has been kept. This record gives the name of the pilot and passenger, the type of machine, the time in air, and the elevation reached during flight. All these records have been carefully compiled with a view of ascertaining whether or not any clue

to the causes of the accidents could be determined therefrom.

The following table gives the data as to the amount of use to which the machines were put previous to the time of the accidents:

The following indicates the experience of the pilots who were killed:

Accident No.	Type of Machine	Hours in Air	Number of Flights
1	Original Wright*		
2	Curtiss D	Record incomplete	Record incomplete
3	Wright C*		
4	Wright B	26.03	149
5	Curtiss Flying Boat	21.60	59
6	Curtiss D	Record incomplete	Record incomplete
7	Wright C	23.68	132
8	Burgess	31.40	178
9	Wright C	8.10	68
10	Wright C	00.21	2
11	Wright C	10.40	49

*Not property of government; undergoing acceptance tests.

Name	Hours in Air	Total Number of Flights	Certificates
Lt G. E. M. Kelly	(No record)	(No record)	
Lt Rockwell	13.40	100	P.
Lt Park	36.98	175	P.-M.A.
Lt Call	16.98	53	
Lt Love	12.25	52	P.
Lt Rich	21.58	60	P.
Lt Ellington	86.85	469	P.-M.A.
Lt Post	59.83	245	P.-M.A.

P.—F. A. I. Pilot.

M. A.—Military Aviator.

From the above it is evident that the machines in which the accidents occurred were not old and the pilots were not novices. Before an officer is detailed on aviation duty he is subjected to a searching physical examination, and as much information as practicable is obtained concerning his temperamental qualifications, and in case there is any doubt with respect to his physical, temperamental or professional qualifications his ap-

plication for this duty is disapproved. After having been detailed he is sent to the Signal Corps Aviation School, where he receives theoretical and practical instruction in the art of flying. In my opinion, nearly every one of the above accidents was due to the pilots and not to the machines.

Lieut. Col., Signal Corps,
U. S. A.
Acting Chief Signal Officer.

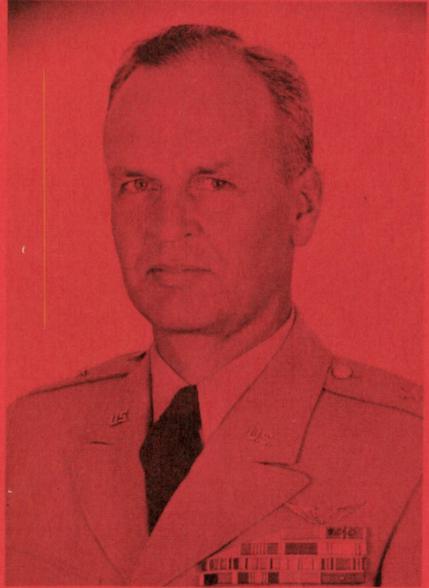
General Cairns New School Commandant

Brigadier General Bogardus S. Cairns has been named Commanding General of the U. S. Army Aviation Center and Commandant of the U. S. Army Aviation School, Fort Rucker, Ala. He succeeds Brigadier General Carl I. Hutton who has departed for his new assignment as Commanding General of the 8th Infantry Division Artillery.

Born in New York City, General Cairns graduated from the U. S. Military Academy in 1932 and was commissioned a second lieutenant of Cavalry. Prior to World War II, his assignments included attendance at the Regular Troop Officers' Course and later the Special Advanced Equitation Course at the Cavalry School. While at Fort Riley, Kansas, he became a member of the Olympic Pentathlon team.

In 1939, General Cairns was assigned to the 13th Armored Regiment of the 1st Armored Division. He served with this unit in Africa as executive officer and later became commanding officer of the 3d Battalion, seeing action in the Oran, Tunisia, Naples-Foggia, Rome-Arno and Anzio campaigns.

Returning to the U. S. in August, 1944, General Cairns was assigned to the Operations Division, War Department General Staff. Later assignments included Staff and Faculty, the Armored School, Fort Knox, Ky., and Headquarters, First Army. In 1946-47, he attended the Combined Arms Course at the Command and General Staff College and in 1948 attended the Armed Forces Staff College in Norfolk, Va. After a tour as instructor at C&GS College, he attended the



1951-52 class at the National War College.

General Cairns returned to Europe in August, 1952, to command Combat Command "R" of the 2d Armored Division until November, 1953, when he became assistant chief of staff, G3, with Headquarters, V Corps, in Frankfurt, Germany. In October, 1954, upon promotion to his present rank, General Cairns became Commanding General, Base Section, USAREUR Communications Zone, at La Rochelle, France.

Upon his return to the U. S. in December, 1955, General Cairns became Deputy to the ACofS, G3, Headquarters, CONARC, Fort Monroe, Va., where he remained until his assignment to the U. S. Army Aviation School in February, 1957. He is a graduate of the Special General Officers' Helicopter Pilot Training Course #57-2.

