

## NAVY OF THE AIR MANNED FROM SCHOOL AT FORT OMAHA

Study of Aviation by the Army Has Centered in the Signal Corps School of Instruction, and Colonel Glassford is Busy Preparing Men to Handle Airships of the Future Campaigns

IN COLONEL W. A. GLASSFORD, commandant at Fort Omaha, one meets a soldier of the approved spirit, with ideas of the new order. He meets one with frank courtesy, is companionably social if you have business worthy his attention, and if you desire to talk aviation, admitting you know little or nothing of it, this man who knows much of it is at once interested. He is not frigidly condescending in the matter, either; he "gives up" like a gentleman anxious to oblige. In two minutes he will have brought forth from this drawer and that pigeonhole, from this table and that stand, printed articles and pictures as an aid to his kindly and incisive explanations. And any person connected with the fort who may have something the colonel thinks will shed more light is reached by telephone with a request to produce at once.

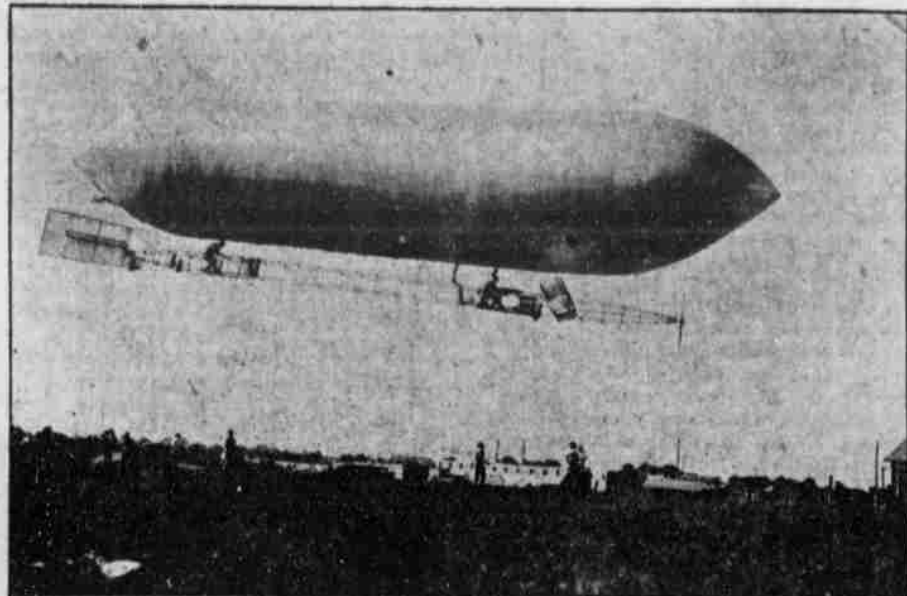
Colonel Glassford has an educated and abiding interest in aeronautics, aerial navigation and all connected therewith. And impresses one as just the kind of man who would make good if, for instance, Fort Omaha became a place to make parts and assemble airships, dirigibles and flying contrivances generally. It is now a great supply depot, but it lacks sadly many things that congress and a generous appropriation can alone provide. The colonel has decided opinions, well based on knowledge, and he talks and writes on aviation and its promise as an element in war most interestingly. Here are some of his views:

"It may be said to be invariable that war initiates nothing, but develops everything that has had trial prior to the war.

"We have no airships, nor will there be many unless several times the sum now proposed be given. By the time we get airships it is possible the aeroplane will have succeeded it in other armies. The aeroplane, first successful in the United States, seems likely to be first adopted abroad.

"Other nations have already extensive military and naval aeronautical plants which have been built up from year to year. The great sums they are now spending are upon development. We have nothing. A considerable plant will be necessary to commence with. Trained military aeronauts must be made. It will take much time to get ourselves to the position to which other nations have arrived in material and personnel. Then only can development commence. The position we might find ourselves in, in case of sudden attack, is alarming."

That Colonel Glassford is competent to express an opinion



UNITED STATES ARMY DIRIGIBLE IN FLIGHT OVER FORT MYER PROVING GROUND.

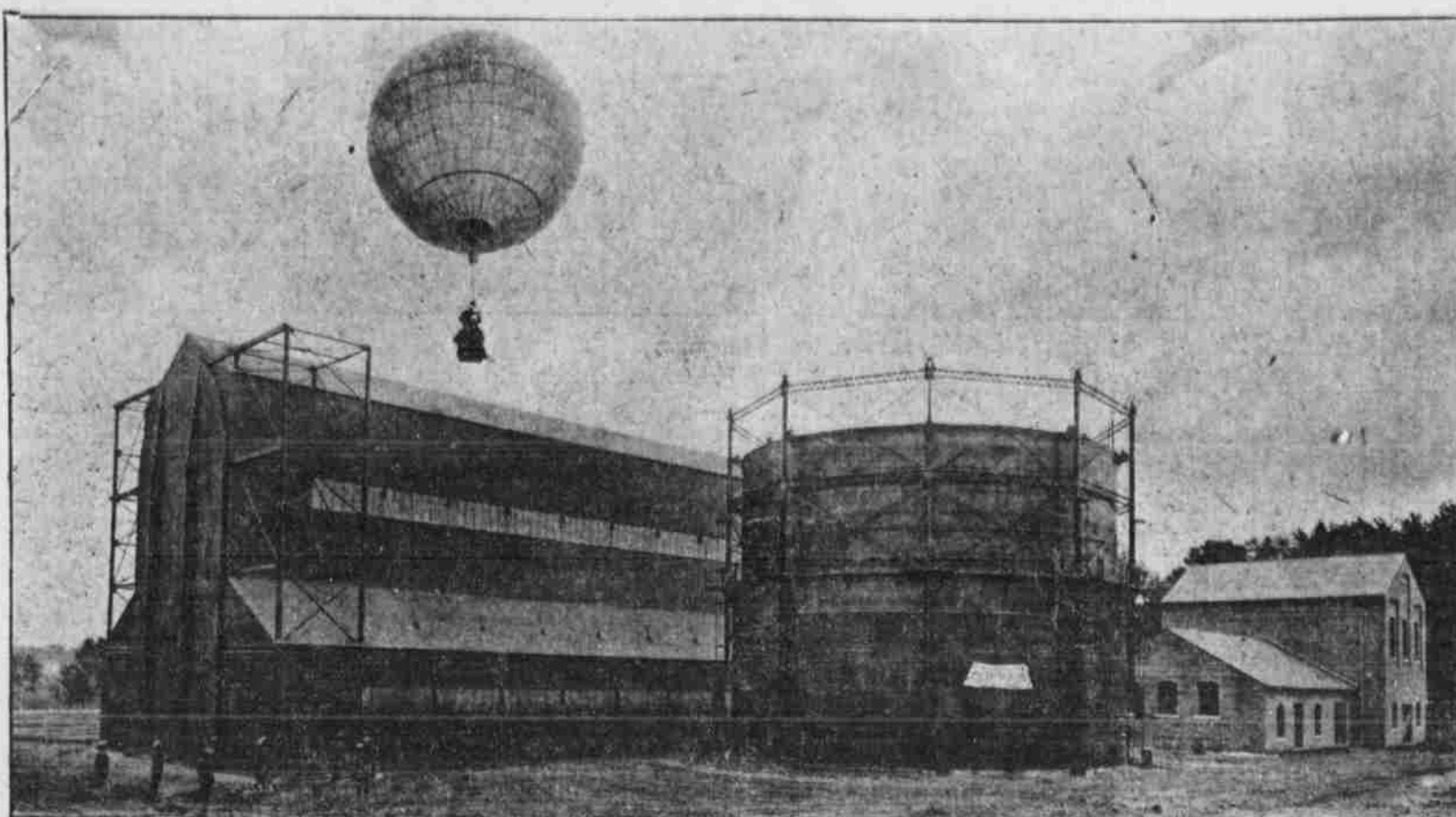
worthy of serious attention no one will question. When, in the fall of 1890, congress extended the scope of work under the signal corps of the army to the duty of collecting and transmitting information, he was sent to Europe to investigate aeronautics there, because the added function of the signal corps' work naturally included aerial navigation, which had even then become a very important means of collecting information. At the time of Colonel Glassford's visit a large balloon for our army was constructed in France, and was sent for exhibition to Chicago, was used at Fort Riley, Kan., and later to Fort Logan, Colo., for practice ascensions. Official reference by the War department to the desirability of developing means of aerial navigation has since been frequent; but, as Colonel Glassford said in an article published in Aeronautics, "there references beat upon deaf legislative ears; politicians could not see what science was bringing on."

In the article referred to Colonel Glassford sums up his conclusions as follows: "The success of the great airships recently developed abroad has awakened the world. With no such ships nor trained aeronauts, it is not difficult to imagine the predicament of this country in case of war. Their importance as a military weapon has impressed every thoughtful mind. Most military men clearly see that the mastery of the air means the mastery for nations. The United States has this mastery within its grasp."

Fort Omaha thus becomes a possible potentiality in the progress of this tremendous epochal development. But not in its present condition of equipment, nor with its present very limited area of territory, Colonel Glassford has sent to the War department, to be submitted to congress, plans for acquiring additional land surrounding the fort, considered necessary to any real experiments by the men of the signal corps stationed here, but nothing has been done; on the contrary, a proposed appropriation looking to more efficient equipment and a wider scope for work at this point was recently defeated in congress.

The Fort Omaha balloon house, which was completed during the summer of 1908, is probably the finest in the world. It was built at a cost of \$34,000 and is constructed entirely of steel, with floor of concrete. The dimensions of the building are: Length, 200 feet; width, 90 feet; height over all, 80 feet. Inside there is a clear space of seventy-five feet in height. Three hundred and twenty-five tons of steel were used in the construction of this building; the doors weigh fourteen tons.

Adjoining the balloon house is a brick building containing the machinery and apparatus for generating and compressing hydrogen. The method of generating hydrogen is known as electrolysis of water. A current of 1,500 amperes is passed through thirty large cells, decomposing the water into its elements, hydrogen and oxygen. The electric power is furnished by the Electric Lighting company of Omaha and delivered at this building a three-phase alternating current of 2,300 volts. It is stepped down by a trans-



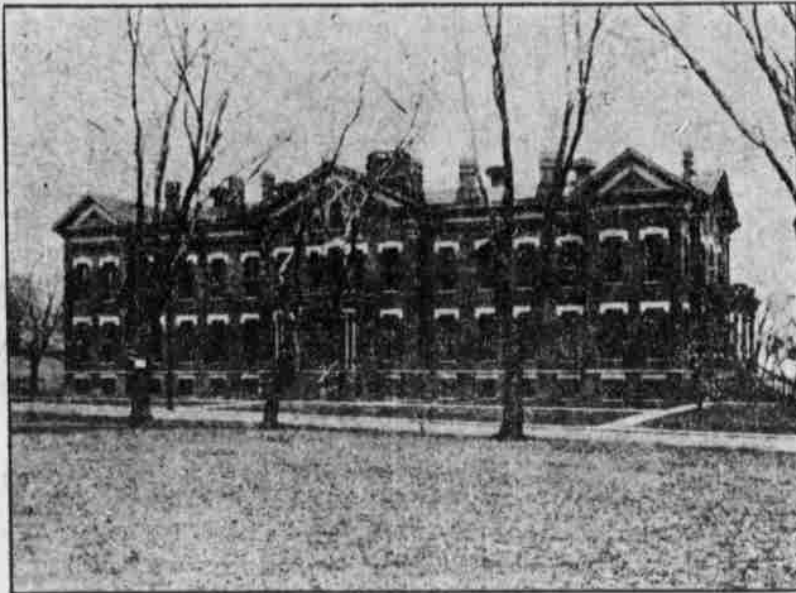
BALLOON HOUSE, GAS HOLDER AND GENERATOR PLANT AT FORT OMAHA.

former to 220 volts, and at this voltage is brought to the generator, which is of 200 horse-power. The motor generator delivers direct current of 1,500 amperes. The output of this plant is 750 cubic feet of pure hydrogen per hour.

One room of the building is equipped for compressing hydrogen. It has a motor-driven four-stage compressor, which is capable of forcing gas into the cylinders at a pressure of 3,000 pounds to the square inch. The pressure used varies, depending upon the weight and strength of each type of cylinder. In the same room there is a motor-driven pump for use in testing cylinders to determine their strength. This hydraulic pump will give a pressure of 5,000 pounds to the square inch. The installation of the equipment was completed and tested in September, 1908. The building, being brick with a steel roof and concrete floor, is absolutely fireproof; and electricity being used for all motive power, the danger of explosion from the gases generated is very slight.

Just north of the gas plant is a gas holder of 50,000 cubic feet capacity. This is fifty-six feet four inches in diameter and forty-eight feet high. When hydrogen is generated it may be piped direct to the balloon house for immediate use or stored in this gas holder.

Mechanical flight has been accomplished, plumb to point of certainty. It is a verified fact, both as to the lighter-than-air machines, the dirigibles and the heavier-than-air machines, the aeroplanes, and to bring home the local application, to stir the pride of Omaha and Nebraska in behalf of holding here what we have, and increasing the plant, it should be kept in mind, as Colonel Glassford points out, that a captive military balloon used by the United States army in connection with military operations has a record of accomplishment quite conspicuous. For the first time in history, artillery fire against a concealed enemy was directed from a United States army balloon. Signal officers of the United States army made the first use of the telegraph from a balloon; and from the same moving vantage point the hiding place of the Spanish fleet was confirmed. Success at San Juan Hill, contributing somewhat largely to making a president of the United States, was in no small degree due to a reopening of fire suggested from the army balloon which was making observations during the siege of Santiago de Cuba; and the



SCHOOL HOUSE AT FORT OMAHA.

same balloon discovered the "trails," or roads, which could be used. These things wrung from General Shafter, who was stubbornly skeptical, an acknowledgment of satisfactory work.

It is no mere dream to forecast such an order as this being issued from Fort Omaha some time in the future: "You will proceed with dirigible No. 1 and aeroplane No. 2 to make a reconnaissance of the Canadian border above Portal, and note what movements, if any, are proceeding about Fort Francis." If the United States congress wakes up and lets go of the pursestrings the army has the men to realize stranger forecasts than the above.

"It is a noteworthy fact," says Colonel Glassford, "that the most conspicuous mention of our balloons during the civil war was made by observers from foreign armies."

Even the great bulk of the officers of our army today give but scant consideration to the balloon as a useful adjunct for operations in the field; and Colonel

Glassford and other men who know the subject say this is solely because the officers have not had opportunities for experience with the new weapon, for such, in a sense, the military balloon or airship is.

A simple description of the signal corps dirigible balloon, with which successful experiments were made at Fort Myer, Va., would be as follows: One hundred and twenty feet long, nineteen and a half feet in diameter, holds 20,000 cubic feet of gas. It contains inside a balloonette, which holds 2,800 cubic feet of gas. The car of the balloon is sixty-six feet long, two and a half feet wide and two and a half feet high. The motor is a twenty horse-power water-cooled Curtiss machine. The propeller at the front of the balloon car is connected to the engine by a steel shaft. The propeller is built of spruce, with a diameter of ten feet eight inches, and turns at the rate of 450 revolutions per minute.

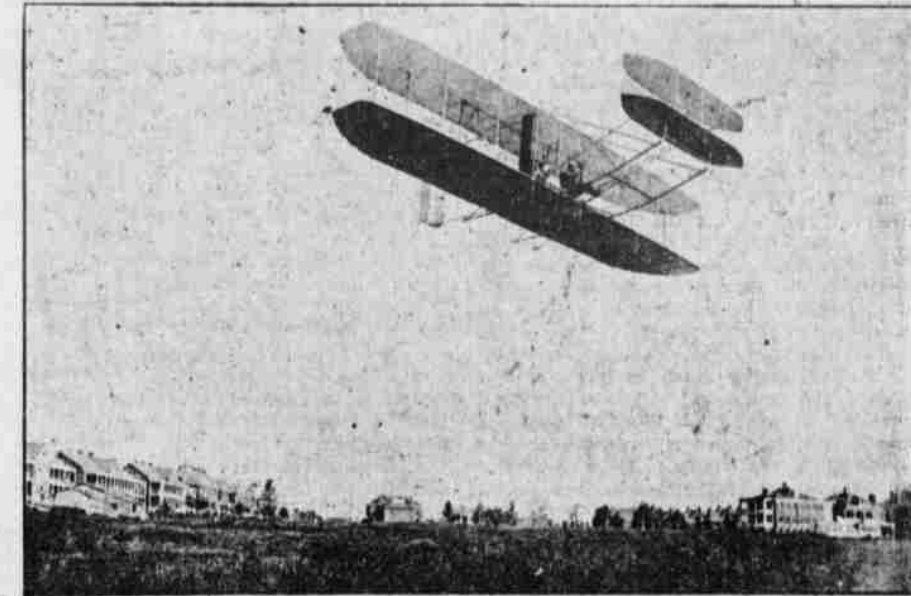
Such a balloon can accomplish much more than the war balloon, that is without propelling mechanism other than the wind. Major George O. Squire, who was in charge of the official army trial at Fort Myer, points out that it can ascend so far into the atmosphere as to take advantage of the air currents to increase its motor-created speed, while every movement is under control of the aeronaut. Held stationary over the enemy's camp or battle line, the observer can note every detail, and if need be photograph the vista; or it can fol-

low the line of march; and it can travel a hundred miles in a very short time to report its information. So superior is it to the ordinary spherical gas balloon that there is no room for argument, in the view of competent judges.

Fort Omaha has this distinction today, that it is the theoretical and practical training school for the signal corps of the army. If it shall continue to hold that distinction, it seems absolutely necessary that the eighty-two acres now comprised in the grounds about the fort will have to be materially enlarged. Even now the school at Fort Omaha is attended by about 250 men, and a very large proportion of those attending are selected men from civil life, or are men who in other branches of the service have shown an aptitude for aviation that would indicate they might become real specialists in that line. At the fort just now there are men who have been laying cable at outlying points on the coast, and clever mechanics and linemen, and telegraphers, and signalmen, and electricians, and aeronauts, and scientists of no mean attainments in their particular subjects, as well as men expert in handling fireworks and others who know how to manipulate mirrors in field work.

Here is really a large group of men who have studied more or less deeply, and many of whom have achieved a fair measure of success in some professional specialty. Their skill is an asset of the country, liable to be drawn on at any time. The greater the pity, therefore, that congress, the body which should do so, has not yet provided what is held to be at least reasonably necessary by the men who are devoting their lives to the study of this vital subject, and its proper development as an adjunct of the army.

Master signal electrician is the highest grade among the men of the signal corps, and the breadth of knowledge that a man must have to attain that rank is not confined to any narrow bounds. The most desirable candidates for the corps are young men with good grammar and high school training, as they have a fine chance to attain distinction because of their trained minds and exact methods of thought. There are several divisions of the school, recruit, telegraph, student, advanced and specialty classes. Recruits advance according to their ability, and having qualified to a certain point of competency are sent wherever their knowledge will make them most valuable, in the opinion of their superiors. The West Indies get some, the Philippines others, Alaska draws a few, and there is call for men of particular equipment on the three cable ships under con-



SUCCESSFUL TYPE OF AEROPLANE IN FLIGHT OVER FORT MYER PROVING GROUND.

rol of the signal corps. Through them knowledge of the Omaha plant is carried to the ends of the earth. Even if they afterward return to civil life, the men who go through this school have a training of the mind and body that gives them advantages above the ordinary. In time of war they might aspire to the higher grades of service with fine prospect of success.

Old Fort Omaha, historic in army annals for the connection with its earlier days of Generals Crook, Brooke, Augur and others, is not unlikely to again figure finely in the pages of United States history. In the old days operations against hostile Indians were directed from regimental headquarters, now the instruction building. In the days to come operations in the field may be directed in a manner undreamed of by the warriors mentioned above. The country about the Welland canal and the Niagara river, with fighting memories scattered all over it, may yet be reconnoitered by dirigibles or aeroplanes from Fort Omaha; and General Brock, on his monument at Queenstown Heights, can easily be imagined as the focal point of a United States army airship out on a scouting expedition.

This old-time regimental headquarters would not seem at all familiar if the officers and privates of the pioneer days, when Omaha was on, or mighty near, the frontier, could return today. The rooms are given up to classes in telegraphy, men studying electric installation, and still others devoting their attention many hours of each day to signal engineering.

There is a reference library that would look mighty strange to Crook or his predecessors, and lectures fill the atmosphere once given over to short, crisp orders by men who were fighters pure and simple. There are in it, too, study rooms and workshops, and machines and tools, instruments and contrivances unknown to the Indian tamers and their cohorts. The personnel and the methods and designs have changed; but the royal old souls can mingle congenially, if they are spiritually present, with the mental fiber of the newer soldiers—for the flag and its protection and undying honor is still the key and the watchword.

While studying aviation, signaling, balloon building, aerial construction and kindred things, the present-day occupants of Fort Omaha have access to modern comforts practically unknown to the men of the other day. There is a salesroom containing articles not furnished by the government, lunch counter, a bowling alley, pool and billiard hall, reading room, gymnasium, hot and cold water, tub and shower baths.

But after all the study and practice of aerial navigation, with all the possibilities of its application to actual warfare, is the great thing here. Wireless telegraphy manipulation, handling of gas, aeronautical gymnastics, balloon ascension stunts—the certainties and uncertainties of a developing science that uncovers new things every day—these be Fort Omaha's forte at this particular stage of its usefulness. And to this central point the workers in Uncle Sam's field of electrical installation, telegraphic and telephonic construc-

### President Taft and His Cabinet in Session



On the Left—President Taft, Secretaries McVeagh, Wickorsham, Meyer, Wilson and Nagel. On the Right—Secretaries Knox, Dickinson, Hitchcock and Ballenger.

(Continued on Page Four.)