OUR AERONAUTICAL ORGANIZATION.

BY C. H. CLAUDY.

Except for sporadic experiments, as at Fort Myer last year, for all the majority know to the contrary, the United States has done nothing in aeronautics. But the impression is erroneous. We have done all that we could do with the money there was available—more, indeed, than anyone thought we could.

Just what is our status, aerially, to-day?

To begin at the beginning, the aeronautical work of the government is all in the hands of the Signal Corps, an arm of the service charged with obtaining and conveying information, and opening lines of transmission of intelligence. Within the Signal Corps, of which Brig.-Gen. James Allen is chief, is the Aeronautical Division. This includes a number of officers, of whom Lieut. Frank P. Lahm is chief, under Gen. Allen, and enlisted men in squads of varying proportions, depending on the work to be done. Major G. O. Squiers is the theoretical expert. The strange proportion of men to officers of about two enlisted men to each officer, which obtains, is explained by the fact that the enlisted men do nothing but erect the balloons, or act as laborers for the towing or holding of aeroplanes. It is the officers alone who do the flying, and to whom is intrusted the actual aerial work. An exception to this was found last year when, on the death of Lieut. Thomas Selfridge in the Wright accident, and before Lieut. Lahm could get to St. Joseph, Mo., where the dirigible was located, Sergt. Ward went up in the dirigible with Lieut. Foulois, and while without experience, succeeded in operating the steering end with credit.

By name, the officers in the aeronautical corps are Lieut. Frank P. Lahm, Major George O. Squiers, Lieut. Benjamin D. Foulois, Lieuts. Winters, Bamberger, and Dickenson. Capt. Charles De F. Chandler is attached to the Signal Corps now as disbursing officer, but is available for aeronautical duty at any time. Of these officers, Lieut. Lahm has had the greatest experience, and he and Capt. Chandler are the two licensed pilots. Lieut. Foulois made a record with the dirigible last year. Winters, Bamberger, and Dickenson have each made a few flights in free balloons, but are still beginners in the art of aviation. Major Squiers has made an exhaustive study of the theory of aviation of all kinds and is an authority on the subject, although his practical experience is limited to a couple of balloon and one aeroplane trips.

The equipment with which the Aeronautical Division has to work comprises a balloon house at Fort Myer, and a balloon house of much greater capacity at Fort Omaha, where is also located a large electrolysis plant for the decomposition of water and the collection and storage of hydrogen, and the compression of it into steel tubes, for transportation. The Aeronautical Division has a number of spherical balloons, one dirigible, and will have at least one and possibly two aeroplanes before another year, being under contract to accept one from A. M. Herring and the Wright brothers, each, if they can satisfy the tests and conditions laid down by the Signal Corps in their original specifications.

The present equipment of the Aeronautical Division is neither large nor strong, but while it is used almost entirely for experimental and training purposes, it must not be supposed for a moment that it could not be used successfully in time of war. The spherical balloons, which can be used either captive or free, are just as able to take an observer aloft in time of war and for photographic or observation purposes, as in time of peace to give him aeronautical experience. The dirigible, while a small one—ninety feet long—has not a very large radius of action. Perhaps five hours in the air would represent its extreme of endurance. Yet it is perfectly efficient for the obtaining of information at a considerable distance.

The aeroplanes will be—one of them at least—the best of their kind in the world. Mr. Herring's machine is a mystery and no one knows whether it will be a success or not. But the Wright machine has demonstrated its efficiency.

Nevertheless, much depends upon who will run an aeroplane—as to how it will behave. The selection of Lieuts. Lahm and Humphreys to be the first aeroplane pupils is a wise one, not only because these gentlemen have had more actual aeronautical experience than anyone else in the army, but because they are both of them the type of men to make a success of any enterprise requiring quick thinking and action and cool nerves.

Perhaps the most interesting thing in connection with army aeronautics which the United States has to show, is the large balloon house at Omaha, which is capable of housing a very large dirigible, several hundred feet long, and of supplying it with gas. Just as soon as Congress sees fit to provide the money, we can immediately build a large dirigible, without having to wait for a balloon house. It is unquestionable that another and much larger balloon house, similar to or larger than the one at Omaha, will be erected at or near Washington. Indeed, Gen. Allen has expressed himself in favor of building it big enough to hold a Zeppelin. Meanwhile, there is the plant at Omaha, ready for the big dirigible when we shall get it. At present it houses the small one. The filling of steel tubes of one cubic foot capacity with 2,000 cubic feet of gas is a regular part of the work at Omaha, so that these tubes, transported from place to place, can afford facilities for erecting and flying either spherical or the dirigible balloon. Hydrogen, of course, has so much greater lifting power than coal gas, that its use is dictated always except for balloons of large size which have not to carry much weight. The "No. 9," seen in the photograph, is capable of making a free flight with two men although it holds but 9,000 cubic feet of gas, which provides a gross lifting power of 630 pounds. The "No. 10," which has a capacity of 80,000 cubic feet, will lift more than a ton, filled with coal gas, and with hydrogen would lift 5,600 pounds. To have hydrogen easily and quickly available, anywhere at any time, is a great part of the work of the electrolysis and compressing plant at Omaha, and the possession of this plant, as well as of the various balloons, dirigibles, and aeroplanes, goes far to give the United States at least a start in aeronautics, whereas we are popularly conceded to be simply a minus quantity.

The Testing of Intelligence.

BY OUR BERLIN CORRESPONDENT.

The multiplicity and diversity of those intellectual forces which individually or collectively are called intelligence, is only too often under-rated. In a recent memoir, E. Stransky draws attention to the error generally made in connection with scientific intelligence tests, so called, by choosing a single aspect of mental life as representative of its totality. It is a common mistake to mix up scientific training with intelligence, appreciating the mental capacity of a person according to the number and character of the notions assimilated at school and outside of it. Now, though a man, by frequently using abstract notions, gives evidence of a high intellectual capacity if these notions have been created by him, or at least acquired with a great deal of mental effort, those deriving the same notions from book reading do not necessarily show any productive superiority over lay people who have no occasion to deal with the same matters.

Generally speaking, it may be said that memory is by no means the only one, and still less, the most elevated of intellectual properties which, combined, make up the intelligence of a man. Again, memory is of two different kinds, possessing different value, viz., either *impressive* or *associative*, according as this faculty relates to the more or less durable impressions left by our perceptions, or to the system of intellectual associations by which new perceptions are united to the existing associative elements. Now, the former kind of memory obviously is far more primitive than the other, and cannot possibly be taken as a gage of intelligence. It is, in fact, generally known that adult persons, having assimilated a large amount of associative elements, are far from being so impressive as children, whose brains are as yet new. Moreover, the most intelligent persons often forget the most rapidly and absolutely what they have learned at school in a purely mechanical manner, even though these matters belong to their special branch. A celebrated physician, Dr. Billroth, has said in this connection that the "really educated people are just those who have forgotten more than others." The intelligence tests recently made in different countries on subjects chosen among the lower classes, have given especially instructive results in this connection by showing the frequently startling ignorance of the most common notions in the case of an individual perfectly capable by his mental capacities of earning his living and governing his house.

To this should be added that memory is only one of the different components of intelligence, and that judgment and power of combination are particularly important among the remaining functions of our intellect. Now, in appreciating the comparative mental forces of school children, this undeniable truth is only too frequently neglected, classification being merely based on the matters absorbed in a more or less superficial manner by the memory of the individual, and in everyday life we are unfortunately inclined to commit the same serious mistake.

In a previous memoir, the author has pointed out the individual diversity existing in the intellectual and psychical reaction to the outside world. There are thus individuals whose inner intellectual life in its extraordinary wealth cannot become fully evident, owing to a relative impotence of mental or merely linguistic manifestation. Another group comprises those who have not always at their disposal a frequently rather extensive knowledge. These individuals require tranquillity and, generally speaking, the concourse of circumstances propitious to their individuality in order to manifest in their entirety their knowledge, judgment, and imagination. They then become capable of accomplishing verily remarkable things, whereas when compelled to give evidence of their capacities and knowledge in a less propitious situation (at an examination, for instance) they are bound miserably to fail, and to appear dull, and even stupid. On the long way traversed by thought before its outside manifestation there are numberless obstacles sufficing to close against the outside world an abundantly gifted intelligence.

From what has been said will be understood what value may be ascribed to intelligence tests made according to a given scheme with watch or meter in hand, and which mainly relate to memory, promptness of repartee, and adaptability of the subject. It would certainly be interesting to test by a really scientific method also the mentality of those particularly gifted individuals whose intellectual life consists of combination rather than reception. Some methods have already been suggested in this connection; the late Dr. Ebbinghaus thus endeavored to use as gage the faculty of supplementing words, and on this basis the author has developed the method of "word deformation." However, all these methods, so far from showing the comparative value of intelligence, at most yield some information as to a given intellectual faculty.

Artificial and Natural Ice.

Natural ice, domestic or imported from Norway, was used exclusively in France twenty years ago. At present, three-quarters of the ice used in France is artificial, although the importers of ice have gradually reduced their price one-half. In interior French cities artificial ice has completely supplanted imported ice. Fifteen years ago considerable quantities of Norwegian ice were still brought to Paris, *via* Dieppe. This commerce has now entirely ceased, and Norwegian ice is used only in cities on or near the seacoast. The annual consumption of ice for cooling purposes in France amounts to 200,000 tons, of which 150,000 tons are manufactured. 4,500,000 tons of ice are used annually in the United States.

A French writer has recently suggested the imposition of a tax upon imported ice, in order to protect the manufacture of pure and wholesome artificial ice. He reminds his readers that this industry is of French origin. The French physicist La Hire first succeeded, in 1685, in freezing water by means of the heat absorbed when sal ammoniac is dissolved. In the nineteenth century another Frenchman, Bourgeois, constructed the first practical ice-making apparatus. In 1875 the method of transporting food in cold storage was created by Ch. Tellier.

Natural ice is not wholesome, as the majority of microbes survive temperatures of from —60 to —170 deg. F. Many sanitary casualties have been caused by the use of impure ice. An epidemic of typhoid fever in Rennes, in 1895, was traced to this cause.

In 1892, at the instigation of the Paris health board, the prefect of the Seine issued an ordinance which restricted the use of natural ice to industrial establishments and admitted as "edible" only artificial ice made either from sterilized water or water drawn from the city mains. Hence a protective duty of 6 francs per metric ton, or about $1.20 per ton, on imported natural ice is demanded.—Cosmos.

Official Meteorological Summary, New York, N. Y., October, 1909.

Atmospheric pressure: Highest, 30.59; lowest, 29.63; mean, 30.05. Temperature: Highest, 75; date, 8th; lowest, 35; date, 30th; mean of warmest day, 67; date, 8th; coolest day, 39; date, 29th; mean of maximum for the month, 59.8; mean of minimum, 46.7; absolute mean, 53.2; normal, 55.5; deficiency compared with the mean of 39 years, 2.3. Warmest mean temperature of October, 61, in 1900; coldest mean, 50, in 1876. Absolute maximum and minimum of October for 39 years, 88 and 31. Average daily excess since January 1st, 0.7. Precipitation: 0.74; greatest in 24 hours, 0.31; date, 23rd; average for October for 39 years, 3.58. Accumulated deficiency since January 1st, 2.64. Greatest precipitation, 11.55, in 1903; least, 0.58, in 1879. Wind: Prevailing direction, west; total movement, 9,396 miles; average hourly velocity, 12.6; maximum velocity, 46 miles per hour. Weather: Clear days, 15; partly cloudy, 8; cloudy, 8; on which 0.01 or more of precipitation occurred, 8. Thunderstorms, 23rd. Frost, heavy, 20th, 21st, 26th. Fog, dense, 10th.

An Inventors' Exhibition.

The Royal Würtemberg Chamber of Commerce is organizing a State exhibition of inventors' models to be held next year at Stuttgart. Its chief purpose is to help poor inventors who have little opportunity of bringing their inventions under the notice of likely purchasers. The directors of the affair promise that strict impartiality will be shown in the selection of exhibits, and that none will be accepted which is not worthy of serious consideration. There will be no expenses of any kind for the very poor inventor, and low fees for the others. It is not said whether the exhibition is expected to be self-supporting, but perhaps not, as the enterprise is being backed by the State.