

of every bank need a course in the art of gracious expression. Why should the depositor of money be regarded with frowning suspicion, and why should his mistake in indorsing checks wrong side up or his failure to have his books balanced regularly, call forth shouts of correction instead of a few words of kindly instruction? After all, he is only ignorant, or only forgetful. No dark scheme for defrauding the bank lurks behind his failure to follow the bank's rules. Courtesy is its own reward. It pays in personal satisfaction, in minimizing friction, in making friends, and in raising you in the eyes of your business associates.

#### THE SHACKLETON ANTARCTIC EXPEDITION.

BY JOHN FLUMMER.

The readiness with which the Australian government voted the sum of \$25,000, and that of New Zealand an additional amount of \$5,000, toward the expenses of the Antarctic expedition under Capt. Shackleton, illustrates the deep interest manifested throughout Australasia in everything connected with the solution of the mystery of the continent surrounding the Southern Pole. Australasian scientists have long given attention to the meteorological questions associated with the great Antarctic continent; and when it was proposed that Prof. David, who holds the chair of geology at Sydney University, and a couple of students should accompany the expedition, a general feeling of satisfaction was expressed.

The steam whaler "Endeavour" was to leave Lyttelton, New Zealand, on the first day of the present year, and after landing stores and all requirements for a year's stay on King Edward VII Land, return to New Zealand. Capt. Shackleton was a member of the expedition in 1901-4 under Capt. Scott, which reached the latitude of 82 deg. 17 min. south at longitude 163 deg. west. The explorers will remain about twelve months in the southland.

The distance from the proposed winter quarters of the expedition to the South Pole is about 730 miles, and of this about 270 miles as the crew flies has already been traversed. An automobile will draw a train of sledges the whole distance of 270 miles, when a number of Manchurian ponies will be employed. In the Scott expedition, ranges of high mountains were found in Victoria Land. They were situated about 82 deg. south, and reached from 10,000 feet to 12,000 feet in height. The coast line was traced due south as far as 83 deg. 20 min. Most of the traveling was accomplished on the great ice sheet floating on the sea front, and which was found to extend 100 miles from east to west, and 270 miles north and south, with a surface so flat and smooth that no change of level at the outer part could be detected by the aneroid. Further toward the shore the crumpling of icebergs and packs from the land created the customary array of hummocks and peaks, which make traveling both difficult and dangerous. Capt. Shackleton possesses the advantage of having his way clear up to within measurable distance of the South Pole, and of having the assistance of mechanical appliances unknown to previous explorers. Should no serious obstacles be encountered it is possible that the expedition will reach its destination within 35 days from the time of starting, traveling at the rate of 20 miles per day.

Prof. David will return in the "Endeavor" to New Zealand, and thence proceed to Sydney, but the limited time at his command will be well employed. Speaking to an interviewer, he said: "I will examine as far as possible, by landing here and there, the geological structure of the Antarctic regions, collect specimens, and obtain photographs; and I also hope to get some temperature and meteorological observations. Australia wants these latter particulars from the southern land urgently, for the Antarctic plays a most important part in the formation of her climate. It is indeed the great factor in controlling the weather conditions of Australia and New Zealand."

The Manchurian ponies which accompany the expedition possess considerable strength and powers of endurance. They number about twelve, and are provided with stalls on board the "Endeavour," but the space allowed for each is so limited that they will have to be on their feet during the whole of the voyage. As an additional precaution, it is proposed to drop a sledge load of provisions at each interval of a hundred miles during the overland journey, thus reducing the weight to be carried during the latter portion, and forming reserve supplies in case of accident during the work of return.

A subsidiary expedition is to leave New Zealand for the Auckland and Campbell Islands. The former are situated about 200 miles south of Stewart Island, the smallest and southernmost of the three islands forming the New Zealand dominion, and possessing an area of about 200,000 acres; the latter islands, embracing an area of 43,440 acres, being situated in latitude 52 deg. 33 min. south and longitude 169 deg. 8 min. west. Both groups, with a number of others, belong to New Zealand. This expedition will form a valuable adjunct to that under the command of Capt. Shackleton, the scientific data obtained being used in

conjunction with that secured by the "Endeavour" party to assist in determining the actual relations of Australasia to Australia and New Zealand on the one hand, and to South America on the other. The party will be a somewhat large one, and include several of the leading Australasian magnetic observers, zoologists, botanists, geologists, and others. The whole of the observations will be conducted in a thoroughly systematic manner, and an effort will be made to obtain evidence bearing on the theory that in the past a vast continent existed in the south polar regions, uniting New Zealand to America in one direction, and to Australia, Kerguelen Land, Mauritius, Madagascar, Gerca, and the island of Tristan d' Acunha in the other.

#### THE WRIGHT AEROPLANE TESTS.

WILBUR WRIGHT'S LATEST FLIGHTS IN FRANCE.

On account of the small race track near Le Mans (670 x 2,600 feet), and also because the great crowd of spectators somewhat confused him, Wilbur Wright made arrangements to fly above the military field at Auvours, which is several miles in length by nearly a mile wide. After the broken plane had been repaired, his machine was towed by an automobile to this new practice ground. The transport of the aeroplane was effected expeditiously, the 7 miles being covered in three-quarters of an hour. After waiting several days before he was able to use the field, Mr. Wright at last, about 6 P. M. on August 21, was able to resume practice and to make two excellent flights of 1 minute 46 seconds and 2 minutes 18 seconds respectively. During these flights, which were made in a 7-mile wind, the aeroplane described a figure 8 and made other complicated curves at a height of from 10 to 50 feet above ground. These flights were witnessed by a great crowd despite the fact that the ground was much more inaccessible than the race track at Le Mans. Some German military men who witnessed them expressed great admiration of the machine and its aviator. When going with the wind in the second flight, Mr. Wright estimated that he attained a speed of practically 50 miles an hour, which was a greater speed than he had ever reached before. The machine worked satisfactorily, and it is probable that Mr. Wright will make the 31-mile flight called for within a very few days.

ORVILLE WRIGHT'S TESTS OF THE GOVERNMENT AEROPLANE.

The younger of the two Wright brothers, Mr. Orville Wright, arrived in Washington on the 21st instant, and, after inspecting the various parts of his aeroplane at Fort Myer, stated that it would require about ten days time in which to assemble the aeroplane and get it ready for the test flights. He has until September 28 in which to make the official speed and endurance trials, and, as the new machine has never been tried, he will doubtless proceed slowly and carefully, as his brother has done in France. The endurance test of 40 miles in an hour he expects to make above the parade ground at Fort Myer, but the speed test will probably be made over a straightaway 5-mile course across country.

#### RECENT MILITARY DIRIGIBLE BALLOONS.

THE BALDWIN AIRSHIP ACCEPTED.

After its preliminary trials to determine the speed, as detailed in our last issue, the committee which had charge of the testing of the Baldwin airship superintended the test for endurance on August 15. In the flight the previous day an average speed of 19.61 miles an hour was maintained. The requirements were that in the endurance flight the airship should maintain an average speed equal to 70 per cent of this and that it should fly continuously for two hours. The test was not started until 6:42 P. M. The same 4½-mile course from Fort Myer to Cherrydale, Va., and return was used as was followed the day before. The speed obtained was somewhat higher in one direction owing to a strong cross wind. The airship rounded the course seven times, and then flew about a mile out and back in order to complete the two-hour flight. It was in the air 2 hours, 1 minute, and 50 seconds, with the motor running continuously, and in this time it traversed a distance of nearly 28 miles. As it fulfilled all the conditions, it has been acquired by the War Department, and Captain Baldwin is at present engaged in instructing the officers of the Signal Corps in its management. A considerable number of short practice flights have already been made.

The dimensions of the new airship are 94 feet long, by 20 feet greatest diameter, its capacity being 19,500 cubic feet of gas. While it is by no means as large as the dirigibles of France, Germany, and England, it is nevertheless of sufficient size to carry two men with ease, and it is expected that it will serve a useful purpose in initiating the officers into the use of this type of air craft. In the endurance test, this new dirigible maintained an average speed of 13¾ miles an hour.

PRACTICE FLIGHTS OF THE NEW GERMAN MILITARY DIRIGIBLES.

During the past week the officers of the German

army have been experimenting with the two new military dirigibles which Germany has recently had constructed—the "Parseval," and the "Gross II.," the latter of which is considerably smaller than the former. On August 14 the "Parseval" made a 2¾-hour flight, during which it circled completely around the city of Berlin. On August 17 it made two more ascents in the morning. The first was quite successful, but during the second the airship entered a cloud and the resulting contraction of the gas caused it to lose its shape and descend rapidly. It struck the ground so hard that one of the officers had his arm broken. The same evening at 10 P. M. the "Gross II." was taken from its shed and driven to Neustadt and return, a total air line distance of about 95 miles. It reached its starting-point at Tegel at 3 A. M., so that, including the various maneuvers that were executed, it averaged about 20 miles an hour. On August 20 the two airships, with the Duke of Saxe-Altenbourg at the helm of the larger, maneuvered for two hours above Berlin. They traversed the Avenue of "Unter den Linden" at a slight elevation above the housetops, and so successfully did they perform different evolutions that the military authorities were greatly pleased. Since the excellent performances of these two new dirigibles, coupled to that of the ill-fated Zeppelin, Germany is now pressing France hard as regards the supremacy of the air from a military point of view.

#### SCIENCE NOTES.

"Neossin," the Chinese edible bird's nest, has been studied by E. V. McCollum, who finds that it is a glucoprotein. It gives Millon's, Adamkiewicz's, the biuret and xanthoproteic reactions. It contains 2 per cent of sulphur, 9.69 per cent of nitrogen and no phosphorus. Hausmann's method showed the nitrogen to be distributed as follows: NH<sub>3</sub>, 1.3 per cent; humus, 1.27 per cent; phosphotungstic acid precipitate, 1.59 per cent; amino acids, 5.53 per cent. The substance is remarkable in that about one-fourth of its sulphur is liberated as SO<sub>2</sub> when the proteid is hydrolyzed with 3 per cent HCl. No sulphites are present in the nest. The gas was washed with CuSO<sub>4</sub> solution and gave no evidence of hydrogen sulphide. The mercaptan sulphur test is very faint. When boiled with 3 per cent HCl, the carbohydrate group is readily split off. The hydrolysis solution was precipitated with phosphotungstic acid and the filtrate used for the estimation of the sugar by Fehling's solution. It showed the presence of 15 per cent of sugar calculated as glucose in the sample. This solution gave an osazone which melts at 183 to 185 deg. C. and has the composition of a hexosazone. Arginine and histidine were identified in the phosphotungstic precipitate. Lysin appears to be absent.

The total oil output of the world may be taken as being about 20,000,000 tons per annum as against 800,000,000 of coal, and of this oil at best only one-third is available for fuel purposes. The crude oil as it comes from the well would be absolutely unfitted for use, as in most cases it gives off inflammable vapors at air temperatures, and these mingling with the air form highly explosive mixtures. The temperature at which such inflammable vapor is evolved is called the "flash point" of the oil, and for use in the British navy no oil with a flash point below 200 deg. F. is allowed on board, although in the German navy and the mercantile marine the limit is fixed at 150 deg. This necessary limitation means that the crude oil as it comes from the well has first to undergo a process of distillation, the more volatile portions yielding petroleum spirit or petrol, employed in motor cars, etc., while higher fractions flashing above 73 deg. F. form the lamp oil, used for illuminating purposes, and with most crude oils it is only the residue, which from American oil is called "residuum" and from Russian oil "ostatki," that fuel oil supplies can be drawn.

The annual report of the Astronomer Royal dealing with the work of the observatory during the past year contains an interesting paragraph on the method of illuminating the field of the transit circle. Sir W. H. Christie records the fact that it was discovered last year that the method of illuminating this field by means of an elliptical annular reflector, lit by an axis lamp, was open to objection, as the tilting of the reflector to different points to produce various degrees of illumination caused a shift in the center of light, and an apparent shift in the wires. A uniform central illumination has now been substituted, a small elliptical reflector with a matt white surface being cemented to the center of the object glass, reflecting the light of a small electric lamp: change in the degree of light is produced by altering the current through the lamp by a rheostat. This plan, says the report, has been in use in the altazimuth for a year with very satisfactory results. Arrangements have been made on each instrument to take a few transits by the old method for the purpose of comparison. A new arrangement of wires has also been inserted in the collimators of the transit circle, thin parallel wires replacing the thick oblique wires in former use.