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NEW YORK, SATURDAY, OCTOBER 23rd, 1909.

The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

A TALK WITH WILBUR WRIGHT.

"No. The next advance in the art of human flight will not be so much in improving the motor as in the practice of high flying. Personally, I am perfectly satisfied with our motor; not that one, but the later type, which has been strengthened in the very part where the cylinder gave way just now." Thus Wilbur Wright. It was in the gathering gloom of an October afternoon, and we were standing alone in the shed which had been built on Governor's Island to house the Wright aeroplane during the late Hudson-Fulton Celebration. A few minutes earlier the machine was on its launching ways, with everything primed for an hour-long flight, in which Wright had purposed to travel up the East River, over the four great bridges that span it, across Manhattan Island, over the Hudson and the Palisades, and return to the starting point, with a wide detour over the Jersey Meadows and across the Upper Bay. We had seen Wright and his mechanic crank the engine by a swift turn of the propellers; had heard the loud explosion and crash, as the forward cylinder tore loose from the crank case; and had seen the wrecked cylinder tear its way through the upper plane and fall at Wright's feet. At the very moment when a million people were lining both shores of the Hudson River, watching with absorbing interest to catch the first glimpse of the author and past master of the art of human flight, lo! here was his machine, rendered an absolute wreck, and the possibility of a Hudson-Fulton flight shut out for good! Under such dramatic conditions of disappointment a Frenchman would have wept. Not so Wilbur Wright. Picking up the broken cylinder, he turned to the small group of which the writer formed one, smiled, gave an almost imperceptible shrug of his shoulders, and quietly remarked, "It is all over, gentlemen."

If there is any appetite for the sensational or melodramatic in Wilbur Wright, he certainly keeps it under masterful control. The fact that he had been opposed to the giving of public exhibitions of flight, and that this was the first and only exception that he had made, would, for most men, have rendered the complete breakdown of his machine a most aggravating disaster. Yet, five minutes later, when we were alone with him and his disabled air craft, he was perfectly composed, and showed his philosophical estimate of the true significance of the mishap by pointing to the broken cylinder and remarking: "This is merely an incident. The machine is an old one that I used at Kitty Hawk. The metal was rather light at the point of fracture. The defect has been remedied in our later motors."

A few months ago we expressed the opinion in these columns that the element which needed most attention in the aeroplane was the motor, and that until the latter had been brought up to the degree of reliability of the automobile motor, the art of flying could not make much material progress. Wilbur Wright, however, does not agree with us. "I have developed my motor to the point at which it has ceased to give me any more anxiety than the motor of an automobile. I have run the later pattern of this motor in an endurance test (not, of course, in the air) for seven consecutive hours, and my machines have made 280 consecutive flights without experiencing motor trouble."

"In what direction, then, will the development of the future be made?" we asked, and again the answer came back: "High flying; we must get up clear of the belt of disturbed air which results from the irregularities of the earth's surface. From now on you will see a great increase in the average elevation at which aviators will make their flights; for not only will they find in the higher strata more favorable atmospheric conditions, but in case of motor trouble, they will have more time and distance in which to recover control or make a safe glide to earth."

Next we raised the question of suitable starting and stopping places, and suggested that the art of flying was handicapped by the present necessity for broad open spaces for the purpose. This brought the reply that since trains, trolley cars, steamboats, and sailing yachts are all provided with special points of departure and arrival, it was a little unfair to quote the necessity for such conveniences as an objection to the aeroplane. "But the problem of alighting, especially during a cross-country flight, is not so serious as you might suppose. It will be largely solved by the high flying to which I referred just now, for, the greater the elevation, the larger the section of country from which the aviator can select a suitable alighting place. Suppose," said Wright, "in making a flight, say of 100 miles, I rose to a height of one mile, and that while at that elevation motor trouble necessitated an immediate descent. Commencing to glide down the air on a grade of one in seven, I would traverse seven miles of country in a straight line before reaching the ground, that is, supposing that the ground were fairly level. But the glide could be made in any direction, and consequently I could choose a landing place on any one of the 150 square miles that would be included in a circle of 14 miles in diameter. The chances would be therefore decidedly in my favor of finding some fairly smooth field, free from obstruction, on which I could come down safely."

Of course, the question of speed came in for discussion, and the reply to the question whether we shall see any great increase in speed in the near future was characteristic. "Why should we wish to increase the speed? It was only a few years ago that the world believed the construction of a successful flying machine to be impossible, and yet there are not many birds that I cannot overtake with that machine." This was presenting the speed question from a new and very sensible standpoint; for it must be admitted that to have surpassed the average speed of the birds thus early in the game is one of the most sensational achievements of this, the latest and most sensational of man's inventions.

THE NEW BRITISH "DREADNOUGHTS" AND "INFLEXIBLES."

Rather complete particulars have lately been made public of the latest British "Dreadnoughts" and "Inflexibles," which are now being built in government and private dockyards. Taking the "Neptune" as the latest representative of the "Dreadnought" type in the British navy, we find that the length has been increased by 20 feet and the beam by 4 feet, and that the displacement has been increased from 17,900 tons to 20,000 tons. The speed, 21 knots, remains the same, and no changes of any consequence have been made in the disposition of the armor for the protection of the hull or the barbettes and turrets.

The most important changes—those which serve greatly to increase the power of this ship as compared with the original "Dreadnought"—relate to the armament. In the "Dreadnought," it will be remembered, ten 12-inch guns were mounted in the following positions: Two on the forecastle deck; a pair on each beam amidships on the main deck, with the superstructure between them; and four in two turrets on the main deck astern and on the center line of the ship. This plan has been changed in the "Neptune" by placing the two wing turrets *en echelon*, or diagonally, with sufficient distance between them in the fore and aft direction to permit the guns of both turrets to fire on the same broadside. Another change is to raise these two turrets and also turret number 4, one deck higher, placing them at the same elevation as the forward turret. The aftermost turret will be located, as in the "Dreadnought," on the main deck. By this redistribution the "Neptune" can fire six guns ahead, eight astern, and ten on each broadside, as against six ahead and astern, and eight on each broadside, in the original "Dreadnought." The "Neptune" will carry a new 50-caliber, wire-wound 12-inch gun, and not, as reported, a 13.5-inch gun. For torpedo attack a battery of 4.7-inch guns will be mounted in a lofty central armored redoubt surrounding the smokestacks, which will protect both the guns and the smokestack bases.

The improved "Inflexible," known as the "Indefatigable," has 25 feet more length, 2 feet more beam, and 2,000 tons additional displacement than Admiral Seymour's flagship. The speed is the same; but the extra 20 feet of length will enable the midship turrets to be placed farther apart in the fore and aft direction than they are in the "Inflexible," with the result that the broadside angle of fire of what might be called the "off turret," that is to say, the turret which is on the side of the ship remote from that on which an engagement is taking place, will be greatly increased.

Great Britain evidently is well pleased with her 26-knot battleship cruisers of the "Inflexible" type, for she is now preparing to lay down on the ways vacated by the "Indefatigable" another ship of the same type but of far greater dimensions. She is to be 600 feet in length, and equipped with turbine machinery of even greater horse-power than that installed in the "Lusitania" and "Mauretania." As these liners exert over 70,000 horse-power when they are making their maximum speed of 26 knots, it can be understood that to secure the 28 knots required in the new cruiser-battleship, the horse-power must run up to 80,000 or more. It is probable that the vessel, on her trials, like her predecessors of the "Inflexible" class, will exceed the requirements by about a couple of knots. The "Inflexible" and her sisters made 28 knots over short distances, and it is likely that the 600-foot ship will be able to carry her battery of eight 12-inch guns for a short spurt across the high seas at a speed of 30 knots an hour, which is higher than the average speed of the torpedo-boat destroyers.

SOME PHOTOCHEMICAL REACTIONS.

A quantity of benzaldehyde, inclosed in a sealed glass tube and exposed to light, is almost entirely converted into a red brown, transparent resin which, when treated with ether, leaves a small quantity of a crystalline residue, fusing at 475 deg. F. and identical with the trimeric modification into which benzaldehyde is converted by the action of iodobenzol.

The resin deposited by the evaporation of the ether from the ethereal solution yields, on distillation, benzoic acid, hydrobenzoin, and unaltered benzaldehyde, and leaves a resinous residue which has the percentage composition, but four times the molecular weight of benzaldehyde, of which it is probably a tetrameric form. It may, however, be a ketone, of the formula $(C_6H_5)_4\ (CO)_2\ (COH)_2$.

Dibenzyliden acetone in alcoholic emulsion exposed to light for a year yields di-isosafrol in addition to the molecular weight of the ketone.

Isosafrol mixed with a trace of iodine and exposed to light for a year yields di-isosafrol in addition to a large proportion of resin, but safrol is unaffected by light. Analogous results are obtained with methyl-eugenol and isomethyleugenol. Propenyl compounds are found to be more affected by light and more readily converted into polymeric forms than members of the allyl group. The action of light on mixtures of benzaldehyde with safrol and isosafrol produces resinous substances which, when purified and analyzed, prove to be simple addition products.

THE SPECTRUM OF MARS.

A bulletin has recently been issued by the Lowell Observatory, in which the results of Mr. Frank W. Very's quantitative measurements of the intensification of great B in the spectrum of Mars are given. The general result of the investigation is that the great B in Mars is 15 per cent stronger than in the spectrum of the moon at the same altitude, and that B in the spectrum of Mars is relatively more intense by eight times the probable error of the result. Mr. Very states that while there is considerable variation, there are no contradictory results. In Mr. Very's opinion, the measurement proves, beyond a doubt, that it is possible to discriminate differences of a few per cent in the intensities of spectral lines, although it would take much wider variations to attract the attention of a casual or even of a careful observer, if deprived of such assistance as can be given by the spectral band comparator. In his recent Mount Whitney studies, Prof. W. W. Campbell, of the Lick Observatory, stated that the A band was faint in both the lunar and solar spectra when the bodies were low, fainter when the bodies were higher, and very faint when the bodies were at their highest; but for equal altitudes, the A band in the Martian and lunar spectra were equally intense, plainly signifying that the observed bands were due to water vapor in the earth's atmosphere above the summit of Mount Whitney. Here is obviously a conflict which must be settled before we know definitely whether or not the spectrum of Mars does contain water vapor.

In the Revue de la Soudure Autogène, Bournonville describes a method of repairing cracked iron pulleys by local heating. The crack in the rim is opened by means of an expansion screw acting on the two adjoining spokes, so as to make a gap about 1/16 inch to 1/24 inch in width. Welding metal being then melted in the crack by means of the oxy-acetylene flame, the expansion screw is withdrawn quickly, while the metal is still red hot, and the elastic pressure of the rim counteracts the contraction of the joint in cooling. No special care is needed in cooling, and the metal can be tempered without risk of cracking.