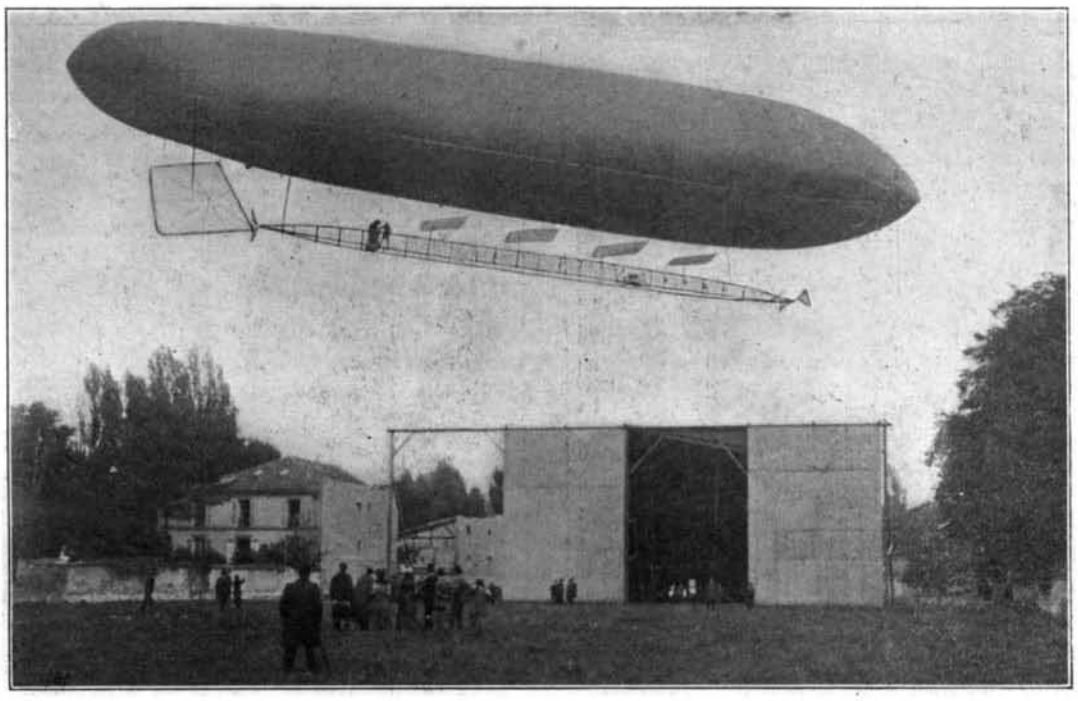
about an inch of stalk, and drop them into large baskets. The onion seeds are green when gathered, and, if cut in the morning, when the dew is still on them, take a longer time to dry than if gathered in the afternoon. The pods are conveyed in sacks in a wagon to the drying-ground, where they are spread out on large sheets to dry. Daily the heaps are turned over with a wooden fork, so as to facilitate the process of drying, which occupies two weeks or thereabout. As rain scarcely ever falls during the drying season, and the sun shines almost continuously during the hours of daylight, the operation progresses rapidly.

When the pods are thoroughly dried, they are conveyed to the threshing-machine, in which a wheel making six hundred revolutions a minute winnows the seed from the chaff. The seed is carried into large sacks, while the chaff goes into the air in a cloud, which whitens everybody and everything within reach. Next it is washed in a trough to remove dirt and imperfectly developed seeds, which latter float on the surface of the water and are skimmed off. After the washing the seeds are again spread out to dry, and in four or five days are raked up and passed through a fan mill. Then they are put into sacks, each containing one hundred pounds, in which shape the commodity is marketed. The harvest being over, the stubble is burned and the ground plowed in readiness for planting the next crop after the early rains.

THE NEW SANTOS-DUMONT AIRSHIP.

With the lamentable failure of Prof. Langley's aerodrome and the accident which befell Dr. Greth still fresh in the public mind, one cannot help but admire the courage which Santos-Dumont has displayed in navigating the ten airships which he has thus far constructed. Severo and De Bradsky, in machines that differed not radically from his, both lost their lives. Still, he persists in adhering to his design with a pertinacity that shows he has the courage of his convictions. With the new airships, numbers 9 and 10, he has kept himself pretty much in the public eye of late by various theatrical exploits. He sails in to town for breakfast in an airship; he picks up children in some public park, takes them for a sail, and brings them back safe and sound; more recently the United States Minister to Portugal had the doubtful pleasure of accompanying him upon an airship jaunt.

The latest balloon, the No. 10, with which he has done some of these wonderful things, in some respects marks a departure from his previous designs. The car is about 100 feet long. Its carrying capacity is said to be ten persons. Its voluminous gas bag can contain 1,650 cubic yards of hydrogen. Its form is that of an elongated ellipsoid, measuring 159 feet, with a maximum width of 23 feet. The two ends are pointed. The envelop of the balloon, with its 850 square yards of surface, is divided into three compartments, each having a volume of 550 cubic yards. At about the center of the balloon are two interior air bags of unequal size, which communicate with each other by means of a canvas sleeve. A Clement petrol motor of 60 horse power drives two propellers of 12 feet diameter, both having the same screw pitch. In all, five baskets are to be distributed along the car-frame. Since the tendency to pitch will be thereby increased, two pairs of horizontal planes are placed to the forward and rear of the center of the framework, which are arranged along the axis, for the purpose of keeping the craft in proper longitudinal trim. The planes measure 6 x 6 feet, and have in all 144 square feet of resistant surface. They are movable, and are controlled by a set of levers.



THE SANTOS-DUMONT NO. 10, ON ITS FIRST ASCENT, OCTOBER 19.

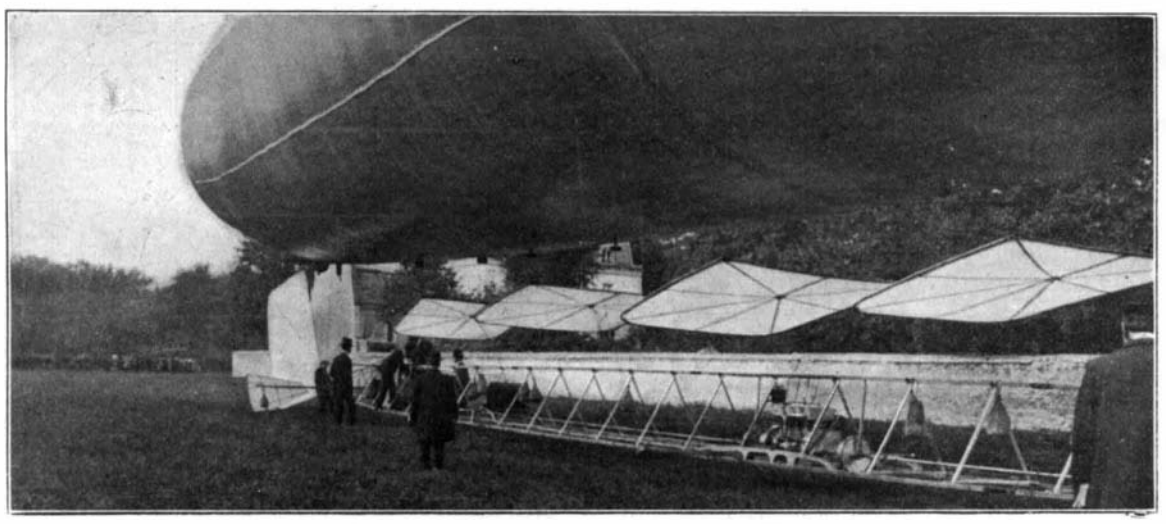
Five baskets in all will be used, the total carrying capacity being 10 passengers.

Wireless communication has been established between Japan and Formosa.

Important Step in Electric Traction.

A practical experiment of the highest importance and interest in the development of electrical railway service is now in progress on a suburban line between Niederschönweide and Spindlersfelde, in the southeastern quarter of Berlin.

During the past week there has been in daily operation a car driven by a new motor invented by a young Austrian electrician and built from his plans by the Union Electric Company, of Berlin. This motor achieves with apparently entire success what has not been accomplished hitherto—at least not in Europe; it propels the full-sized service car at any desirable degree of speed without employing any cumbrous and expensive regulating devices, while deriving its energy from a single-phase alternating current of 6,000 volts, carried along the line on one small trolley wire and delivered directly to the motor without conversion to a lower voltage or a continuous current.



A VIEW OF THE AIRSHIP, SHOWING ITS MOTOR AND PLANES.

The far-reaching importance of this demonstration—which will be at once recognized by every electrical engineer—will be apparent when it is remembered that electric traction, which has proven so effective and economical for interurban and suburban service, has met hitherto some very serious economic difficulties when applied to long distances. The method heretofore employed has been to send over the line alternating currents of high pressure which are taken off at intervals by substations equipped with step-down converters that reduce it to a continuous current of low voltage, which is fed into the trolley wire or third rail and thus transmitted to the motors of passing trains.

As already noted, this works very well for short lines such as are required in city and suburban transit and which are thronged with constant traffic. But when the proposition is to extend the same practice to a standard railway, connecting two cities from 100 to 300 miles apart, the cost of the installation and working expenses become practically prohibitive. Besides the frequent substations equipped with transformers capable of converting the high-voltage alternating current into a low-pressure continuous one, there is the question of heavy copper conductors throughout the line, and this, added to the fact that the transformers and rotary converters must stand idle except when the converted current is taken off and used by some passing train, has hitherto rendered the proposition economically untenable.

When the high-speed experiments were tried last year on the government railway line between Marienfelde and Zossen, an alternating three-phase current of 10,000 to 12,000 volts was carried along the line on three copper wires and conducted thence by trolleys to transformers carried under the floor of the car, whence it was transformed to 1,150 to 1,800 volts and passed into the three-phase induction motors. The car, as will be remembered, easily attained a speed of 140 to 150 kilometers an hour, at which pace the rails began to give way. The further experiments had to be postponed until a more solid and substantial track could be provided.

The present experiment has therefore a wholly different purpose. It involves no question of extreme high speed, but rather the transmission of a single-phase alternating current at a voltage (6,000 volts in this case) sufficient to carry it over a long line on a small and relatively inexpensive wire, and the direct use of the current, without transformation, by a motor capable of running economically at any desirable speed and which fulfills all the other requirements of electric traction. The point demonstrated by the tests now in progress is the effectiveness of the new motor for the special purpose to which it is applied. No sparking or other technical difficulty appears thus far to shadow the success of the experiments. The system eliminates the expensive substations, with their heavy initial outlay and operating expenses, and is so simple and direct in its working that it may, at least in theory, be applied to lines several hundred miles in length. If the distances are very great, of course the power may be transmitted from a distant waterfall or steam plant at any desired pressure—say, 20,000 or 50,000 volts—and then reduced in ordinary transformers, requiring no especial care, to the working-line voltage of, say, 6,000 or more. The present tests are over a line of 3 or 4 miles in extent, the length being immaterial. There may be encountered new technical difficulties when this distance is increased to as many hundred miles, but such difficulties are only such as may be met in any long-distance transmission and such as electrical science at its present stage is fully prepared to overcome. The new motor is believed to have bridged the chasm and opened the way to economical, and therefore practical, long-distance electric traction on railways of standard capacity.

Other Things Besides Radium.

S. W., in Nature, asks the following question: When a small magnet in my drawer has been ready to act on a compass any time during the last twenty years, and has not altered its appearance in any appreciable way, I ask, whence comes the continuous magnetic supply? Again, when a lady has had for a great many years a cedar workbox, which has never failed of its characteristic odor, it is a natural question to ask, whence comes the smell? The statement in books, both of physics and physiology, is that something material is given off from the wood which alights on the olfactory membrane of the nose. This is purely gratuitous, as the statement is without a shadow of proof, the box being to all appearances in no way diminished in size or otherwise altered. If the hypothesis, for it is nothing more, fails, how does the case differ in principle from that of radium?

In Germany it is intended to make the restored Saalsburg in the Rhine country a museum for antiquities from the Roman occupation and earlier times. To decorate the museum various statues of Roman emperors are in preparation. The sculptor Goetz, of Berlin, has completed his models of Adrian and Alexander Severus and submitted them to the German Emperor.