ARTIFICIAL SEA BATHS.

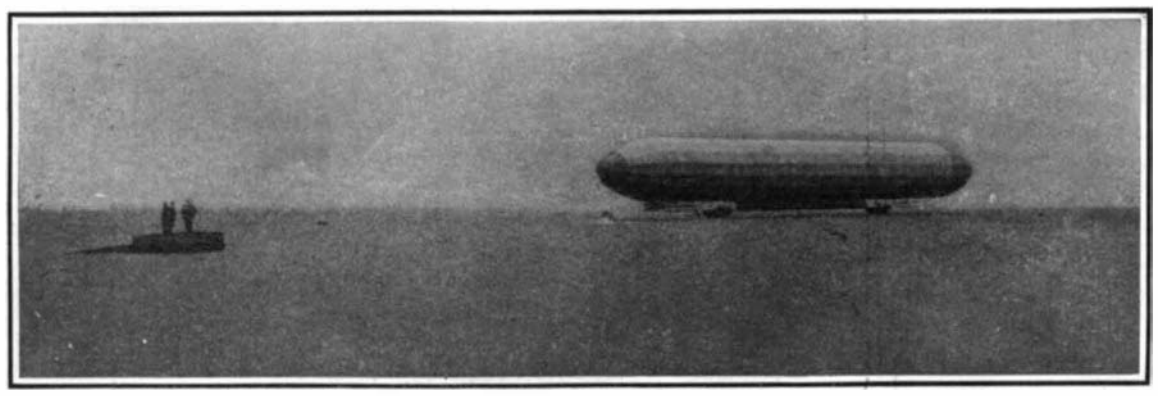
BY DR. ALFRED GRADENWITZ.

A decided novelty for inland summer resorts is provided by the artificial surf bath which is herewith illustrated. The scheme is the invention of Herr Höglauer, of Munich, Germany. With the assistance of Herr H. Recknagel, a plant was installed in the Starnberg lake near Munich, last summer, and proved to be a great success, yielding very satisfactory financial results. The project calls for a tank of water, or the inclosure of a portion of the lake or river in which it is installed, as shown in the photographs. At the outer end of the inclosure is the wave-forming machinery which comprises either an oscillating partition or a plunger dropped periodically into the water. In this way the waves are formed and they travel the length of the tank. The tank is provided with a sloping bottom so that the receding waters from one wave, meeting the succeeding wave, will cause the latter to curl and break in perfect imitation of the ocean surf. If the device is installed in a tank, it is possible to exactly reproduce the conditions of ocean bathing by adding salt to the water and thus preserving the hygienic and therapeutic properties of the ocean bath. The power necessary to produce the waves is very small, as the motion is rhythmic. For example, in the case of waves measuring 2 meters (6.5 feet) from crest to crest, the best results are secured with a rate of 18 waves per minute, when the expenditure of energy will be 4 horse-power for a tank 1 meter (3.3 feet) in breadth. If steam power be used, the exhaust steam of the engine may be utilized for heating the water. Thus the temperature of a bath may be regulated to the desired degree and by the proper control of the engine the roughness of the waves may also be regulated so as to make the bath an ideal one. The inventor has also designed a small device for use in tubs, whereby the tub is rocked to produce the wave effect. The rocking of the tub may be effected either with an electric motor or by means of oars operated by the bather himself.

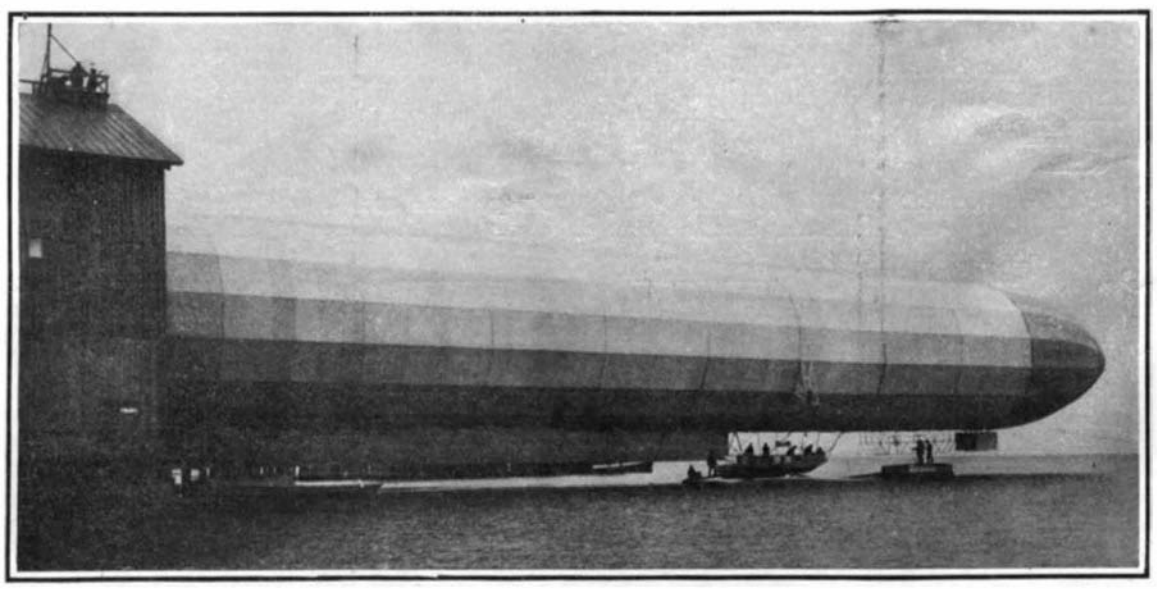
COUNT VON ZEPPELIN'S DIRIGIBLE AIRSHIP.

General Count von Zeppelin has repeated the Bodensee experiments with his dirigible airship, which were concluded in 1900, and undertook an ascension on November 30. For several reasons, in no way involving the principle of construction, it was necessary to desist from this attempt for the present.

For the sake of completeness, it is necessary briefly to recount the results of the experiments of 1900, which at the time were discussed in well-illustrated articles in the SCIENTIFIC AMERICAN. Three flights were accomplished five years ago—on the 2d of July, the 17th and 21st of October. In July the craft demonstrated that it could be steered and propelled against a breeze moving at the rate of about 18 feet a second. At that time the full power of the engines was not utilized, as strong longitudinal oscillations had to be contended with, these being due to the fact that the rear retaining ropes of the airship were released too late. In addition, the crank of the adjustable sliding weight broke, so that it was possible to maintain a state of equilibrium only by running the engines alternately forward and backward. The landing upon the surface of the lake, announced beforehand by means of flag signals, was completely successful.



TRIAL TRIP OF ZEPPELIN'S IMPROVED AIRSHIP.



THE IMPROVED DIRIGIBLE AIRSHIP OF COUNT ZEPPELIN.

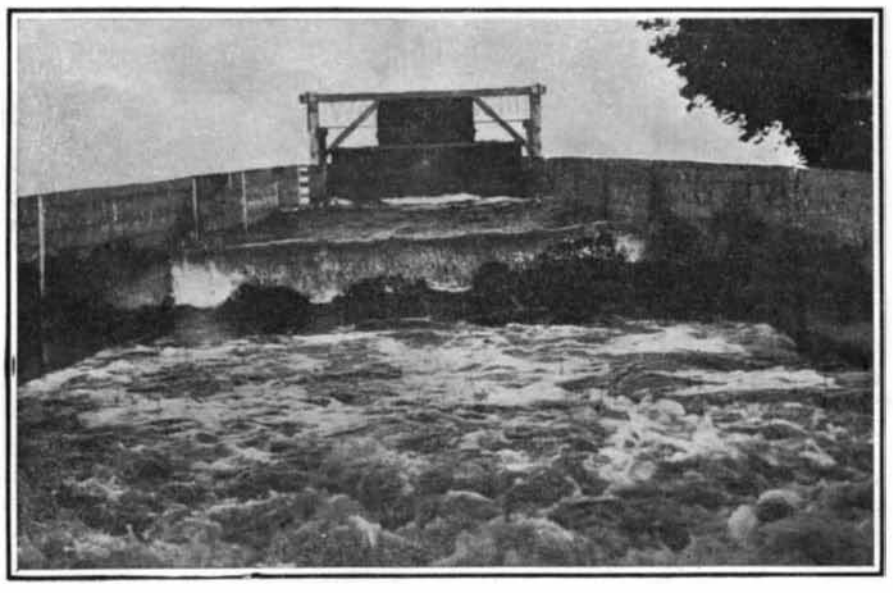
After a number of improvements, complicated through an unfortunate occurrence—the failure of certain fastenings of the framework and the collapse of the middle part—the second trial trip took place. A position of equilibrium was attained successfully at a height of about 300 yards, but the steering-gear caught in the outer portion of the skeleton and was held to port, thus producing a swinging movement. This was counteracted by using the second rudder in opposition to the other; but this time also it was not possible to use full power, as the hour was late and a landing was imperative. This was accomplished sooner than was intended, as a valve in the balloon opened of its own accord, permitting the escape of the gas in a forward compartment. The ship had been in the air for 80 minutes.

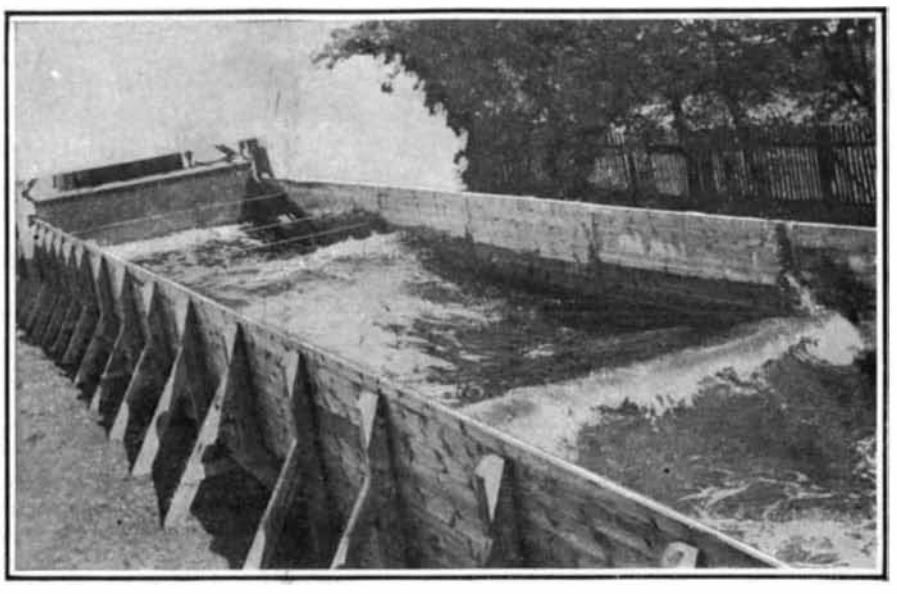
Both defects were soon remedied, and four days later the imposing craft rose into the air for the third time. The dirigibility was excellently demonstrated, this time in fact with two instead of four steering surfaces. Several great arcs were described to right and left. After a flight of 23 minutes a landing was made, again because of the lateness of the hour. As the financial resources of the constructing company were exhausted, further experiments were not possible.

The speed attained by the airship itself was found to be 24.5 feet per second, a rate, nearly 18 miles per hour, never before accomplished. The determination was made by three careful and independent surveyors, stationed at three different points on the shores of the Bodensee. The wind blew at the rate of about 11 feet per second. Taking into consideration the curves of the flight, Prof. Hergesell has calculated the independent speed to have been as high as 28 feet a second. This success was unquestionable.

Following the experience gained in 1900, the motor airship was improved in almost all its details. The greatest advance lies in the increase of the motive power with practically no increase of weight. Each of the engines in the two carriages is now of 85 horse-power, so that to-day 170 horse-power is available instead of 30 as formerly. As this weighs only 11 pounds more than the earlier installation—880 pounds *in toto*—even the layman will recognize that the independent speed of the craft must be far greater. The length of the airship has been decreased by about two yards, the diameter being made somewhat greater. With a length over all of nearly 410 feet, the diameter is a trifle over 38 feet. Instead of seventeen gas compartments, the balloon now contains one less, with a total cubical content of hydrogen gas of about 367,120 feet, some 31,700 cubic feet less than in the former model. The total weight to be lifted is about 19,800 pounds, nearly 2,200 less than in 1900. The propellers have been made somewhat larger.

The two steersmen or guides, aeronautic and aerostatic, were located in the forward car, where also were the wires, arranged visibly upon a board, which led to the valves of the gas chambers and the ballast bags. The latter, made of a waterproof material and filled with liquid, were equally distributed upon the skeleton; part of the ballast was also located upon the cars, and two of the bags are distinctly visible upon one of the accompanying photographs. Benzine, sufficient for a trip lasting 15 to 20 hours, was carried in special tanks in the two cars. In the possibility of long flight duration, the Zeppelin airship possesses a particular advantage which Lebaudy has not yet taken into consideration. This, too, is the reason why Count Zeppelin built his ship of such great size. If it is desired to transport large weights, it is necessary to con-





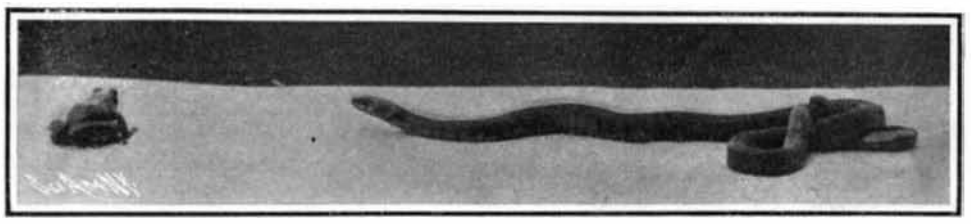
AN APPARATUS FOR PRODUCING ARTIFICIAL SURF BY MEANS OF AN OSCILLATING PARTITION OR A PLUNGER DROPPED PERIODICALLY INTO A TANK OR INCLOSURE CONTAINING WATER.

struct large airships; this is dependent upon the carrying capacity of the gases. Fore and aft there are three vertical linen surfaces for horizontal steering. Between these and the car bodies are horizontal surfaces for vertical steering, the vanes being arranged one above the other as in an aeroplane. The aeronautic guide or steersman controls all rudders from his position.

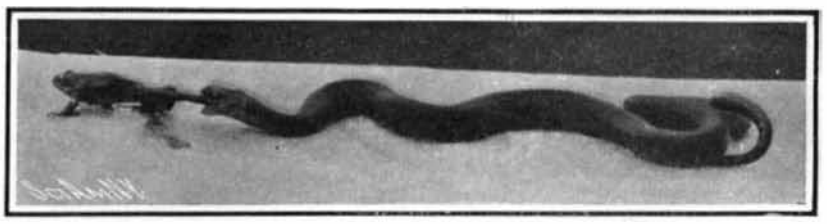
In the test of November 30, it was noticed that the aeronautic steersman of 1900, Von Krogh, was located in the rear car and was replaced, forward, by the engineer of the airship. This change of the guidance in tests of such a difficult nature naturally caused some surprise among the experts, especially as the steersman was able to acquire but little experience in the few ascensions he had undertaken previously in a balloon of the ordinary type. Every aeronaut is familiar with the difficulty in the guidance of a large balloon of even the usual kind, and in a motor airship this difficulty is largely aggravated.

The filling of the gas-bag was accomplished on November 29 in six hours—the first attempt required fourteen, the second seven hours—and on the following day the craft was drawn out from the house, the wind at this time having a velocity of 19.5 feet per second. In the forward car were Count von Zeppelin, Engineer Dürr, and two machinists, and in the after car, Von Krogh, Eugen Wolf (the well-known African traveler, who also participated in the trials of 1900), and two machinists. According to the various newspaper accounts published by Eugen Wolf and the accounts of witnesses upon the balloon house, a steamer, etc., the trial occurred as follows: The running out of the craft from the house presented the first difficulty, for the lake was at a very low level, and the airship could not, as intended, be drawn out upon the lake while resting on a float, but had to be pulled forth directly by means of a tug. The turning against the wind, which blew toward the shore, was not intended to take place until a position farther out in the lake had been attained. But small causes give rise to great effects. The wind drove the airship ahead of the tug, so that it was necessary to drop the towrope. Because of a knot in the latter, it remained attached to the balloon, and this received so strong an impulse at the forward extremity, that the forward steering apparatus entered the water while the after car was still suspended in the air. Furthermore, the forward motor obstinately refused to work, By means of the release of ballast and through the efforts of the second motor, the airship was again sent aloft; but as the forward steering gear had become useless, the trial was soon given up, and the airship returned to the house, where it arrived after the expiration of an hour and a half.

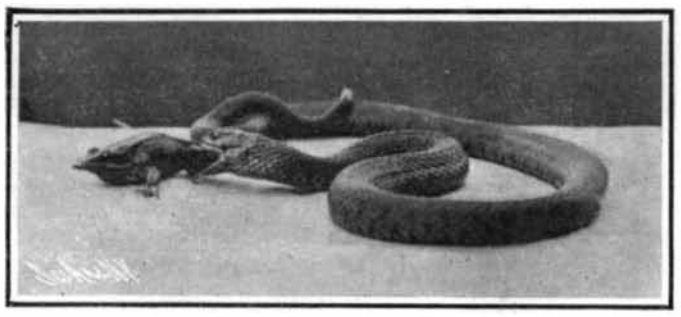
The experiments will soon be renewed. It must be remarked that this trip was undertaken merely as a tentative trial. Count von Zeppelin never intended to immediately travel back and forth over the Bodensee for hours, but all the details were thoroughly to be tested, first in shorter and then in longer flights. Many people expect immediate and successful results from a structure as difficult to control as a dirigible airship, while this is not the case in other new machines. It is to be hoped that we shall soon hear something further about the airship of the energetic Count.



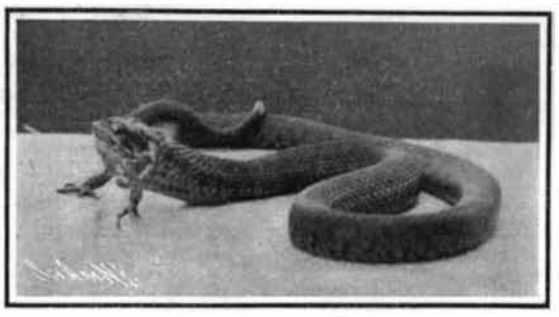
Approaching His Prey.



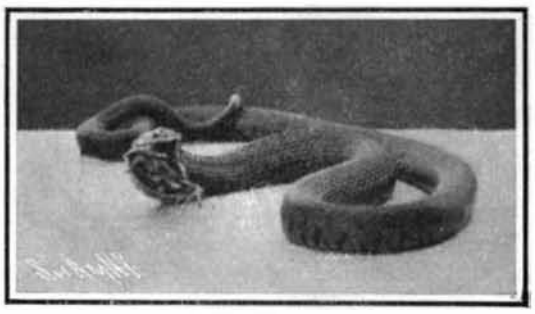
The Prey Captured.



Swallowing Well Under Way.



Only the Head and Forelegs Project.



The End.

HOW SNAKES FEED.

HOW SNAKES FEED.

The manner in which snakes procure and consume their food is of ever-recurring interest to all of us, but as this detail of natural history is known to nearly everyone, the accompanying illustrations require little explanation. In the first of the engravings is depicted the rather dignified but nevertheless determined advance of the reptile upon its victim, in this case a good-sized frog, whose attitude denotes an indifference to be followed by dire results later. In the second photograph the frog is shown making desperate efforts to escape from the snake, which has seized the unfortunate by the hind leg, after the sudden dart in which the gradual approach culminated. The third photograph shows the act of swallowing the prey well under way, while in the next the frog has been so far consumed that only the head and fore-legs project from the mouth of the reptile. In this and in the last illustration, the remarkable distending powers of the elastic jaws of the snake are shown; and if we compare the head of the reptile in the first and last photographs, we find it difficult to believe that the creature is the same in both instances. That the swallowing of the frog was not a very difficult performance is demonstrated by the fact that from the positions of the snake in the last three pictures, it apparently was obliged to move only the fore part of its body while at the latter stages of the meal.

A NOVEL TENT.

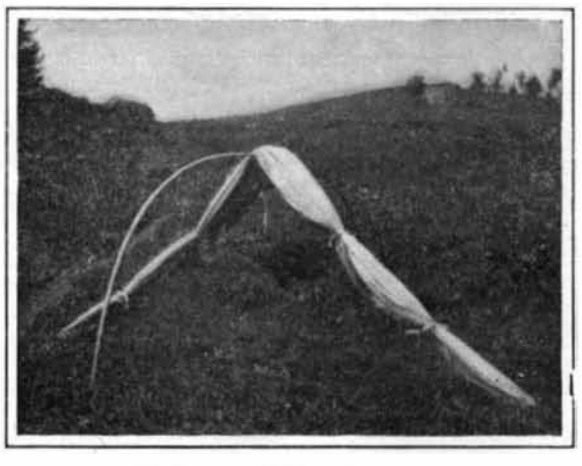
BY EMILE GUARINI.

A most interesting tent has recently been constructed by Mr. Frank H. Gotsche, of San Francisco, Cal. The tent is remarkable for its portability. It is easy to pitch and fasten, and is not easily blown down. The shape is very convenient. For the amount of canvas used a remarkably large capacity is obtained.

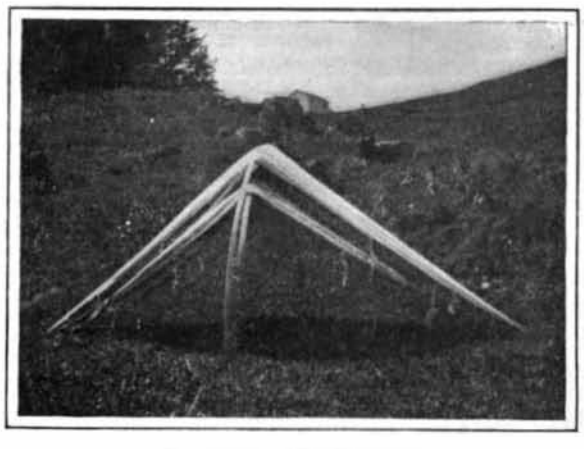
The frame is made up of four wooden sections. These frame sections are held together by metal sleeves or couplings. When ready to pitch the tent, the frame is drawn into a semi-circle and the ends stuck into the ground four to six inches. The cover is then stretched out and drawn over the frame.

Side View of the Tent.

Double Tent Half Open.



Ready for Transportation.



Entrance to Double Tent.

A NOVEL TENT.

A peculiarly advantageous feature of this tent is the fact that a tent of one or two sizes larger can be set over another without touching the smaller tent at any point, thus leaving a complete compartment of air around the inner tent six to twelve inches deep. All who have had to live in permanent camps or in places where the temperature was subject to frequent and great changes will appreciate what this means. This complete air compartment serves as a perfect protection against either heat or cold.

In ordinary weather only two pegs are necessary to stake it. When exposed to a strong wind, more pegs may be used.

New Manufactory for Computing Scales.

A large factory for the manufacture of computing scales is about to be built near Asheville, N. C., by C. F. Christopher, who is the inventor of nine different kinds of these automatic weighing devices. The inventor comes from the western part of Pennsylvania, and while employed as a railroad brakeman, devised an improvement in the locks used on turntables. After he had perfected this invention he disposed of it for $3,500. He turned his attention to other inventions, and made several improvements of different kinds, but the computing scale was the most promising, so that he followed this up with a number of others, and surrounded himself with quite a large business. A local newspaper is authority for the statement that this invention realized $57,000 for the inventor.