

## AERONAUTICS.

A prize of \$500 has been offered for a flight of one mile by an aeroplane above the beach at Daytona, Fla., on any day from March 23rd to 26th inclusive. These are the dates between which the automobile races occur, and every facility will be given aviators to test their machines.

A national grand prize balloon race has been organized to take place next June. The race will start from Indianapolis, Ind., June 5th. It is open to all pilot members of the Aero Club of America or affiliated clubs. Balloons of 2,200 cubic meters (77,693 cubic feet) capacity, or under, must be used, and entrants for this race will also be considered as competing for the Lahm trophy.

The danger which is likely to be met with when a balloon race is started near the sea, has again been emphasized by the finding of the body of Lieut. Foertsch, which was recovered in the North Sea, January 8th last. Both he and his companion lost their lives as the result of their balloon "Hergesell" descending in the sea in the distance race that started from Berlin last October.

Roy Knabenshue, the well-known aeronaut, has an agency for Curtiss motorcycles and aeroplanes in Los Angeles, Cal. In order to show the possibilities of the airship for dropping explosives, he recently made a night flight in his dirigible, and dropped dummy shells upon the city hall and other public buildings. The accuracy with which he frequently hit the mark was a rather startling demonstration of the possibilities in this direction.

Entries for the international balloon race for the Bennett trophy close on March 15th. The fourth contest for this trophy will start from Zurich, Switzerland, next October, it having finally been decided that the race last autumn was won by a Swiss balloon. The Aero Club of America is entitled to three entries, and it is to be hoped that these will be made, and that every effort will be exerted to again capture this trophy, which, it will be remembered, was first won by Lieut. Lahm in 1906.

Entries for the new Bennett aviation trophy, which was recently offered in France, close on March 1st. The course which has been decided upon for the first contest is around a circuit having a perimeter of from 5 to 10 kilometers (3 to 6 miles), the total distance to be accomplished being not less than 20 kilometers (12 miles) from start to finish. The machines will be allowed to alight and start again while making a circuit of the course. The Aero Club of America is entitled to three entries in this contest.

On February 9th a joint entertainment was held by the Automobile Club of America and the Aeronautic Society, in the club house of the former, in New York city. Representative Butler Ames, of Massachusetts, described a new and very interesting type of flying machine of his own invention. This machine consists of a number of short rectangular planes, placed at right angles to each other upon a longitudinal axis and separated by vertical disks. Two rods set at a slight dihedral angle, and each carrying a number of planes, were revolved by a gasoline motor of about 30 horse-power, and Mr. Ames claims to have gotten off the ground once or twice for a short distance. A model of his machine was tested by the towing apparatus in the naval towing tank at Washington, where it was found that while the lifting power increased as the square of the speed, the resistance increased only directly as the speed. The machine resembles a number of air paddles. It is quite peculiar in appearance, and is extremely simple.

At the same meeting Mr. Hudson Maxim made an address upon the backwardness of America as far as governmental recognition of aeronautics is concerned. He stated that instead of not allowing the \$500,000 appropriation which recently failed to pass the House of Representatives, that body should have granted \$5,000,000 for aeronautical purposes. He showed how the perfecting of the aeroplane and airship will bring about the necessity of the defense of all places by similar aerial craft. His address was a stirring one, and it was received with great enthusiasm. Moving pictures were afterward shown of Wilbur Wright, Farman, and Curtiss in flight on their aeroplanes, and anyone seeing these could not fail to be convinced that the age of aviation has arrived at last. Mr. M. O. Anthony demonstrated a new method of wireless control for airships. Both his sending and receiving antennæ consisted of two parallel rods suspended one above the other some 6 feet apart. By means of other special apparatus he was able to start, stop, or reverse a small electric fan run by a storage battery and located at the other side of the room. He already has a 20-foot dirigible operating successfully under wireless control, and a new one three times as large, at present being constructed by Leo Stevens, will be ready in the near future.

## ELECTRICITY.

In the British House of Commons a member has asked the consideration of a regulation compelling electric cars, among other vehicles, to carry speedometers, that the public be safeguarded against reckless speeding and the motormen protected against the charge of exceeding the speed limit.

A company has been formed in Cologne to lay a submarine cable connecting Germany with her colonies. The first section will be laid this year, running from Borkum to Teneriffe. Thence the cable will run to Monrovia, Liberia, and from this point to Pernambuco. The entire length of the cable will be 7,000 miles.

The Indiana Legislature is taking steps to insure better seating capacity in its interurban cars. A bill has recently been introduced, which will require those passengers who are not provided with a seat to pay only half fare. In case the passenger offers a ticket, the conductor must give him a rebate check, which can be cashed at any ticket office.

The Bureau of the Census has just published a preliminary report on the telephone industry in continental United States, exclusive of Alaska. The number of lines and systems is given as 22,971, with a total single-wire mileage of 12,999,369. Over these wires it is estimated that during the year 1907, as many as 11,372,605,063 messages were delivered. The telephone industry gave employment to 143,721 men and women, and the salaries and wages totaled \$68,279,127.

The employees of the Spokane and Inland Empire Electric Railroad Company are now given the opportunity of becoming stockholders in the company. Arrangements have been made with a trust company of Spokane, to furnish any officer or employee of the company with shares of preferred stock at the market price, with a five per cent commission, which is the only profit made by the trust company. The stock may be purchased by paying 15 per cent of the purchase price in cash, and the rest in payments over a period of not longer than five years. It is believed that this arrangement will be of benefit to the employer and employee as well, because it will encourage the latter to work for the mutual good.

The value of wireless telegraphy, in case of danger at sea, was so conclusively demonstrated during the recent accident to the "Republic," that Congress is now considering the question of requiring all vessels that engage in coastwise trade or that touch at ports of the United States, to be equipped with wireless telegraph apparatus. In discussing the bill which is now before Congress, Lieut. Sweet of the navy brought out some interesting facts about wireless telephony, as used in the battleship fleet. He states that conversations were held over a distance of 12 miles, although in some instances the apparatus failed to work satisfactorily. It has been recommended that vessels on the Great Lakes be permitted to use the wireless telephone instead of the telegraph, if they so desire.

Very few of us have any trouble in counting our coin by hand. In mints, however, in banking houses, in the offices of electric railways, and in many other establishments, vast quantities of coin have to be counted and packed daily. An electrical machine lately devised counts coins of any size from pennies to dollars, and wraps them at the rate of 420 per minute as long as the current is transmitted and the coins are fed into the hopper. An expert, while he is in good working order, can count and wrap fifty coins a minute; so it will be seen that the machine does the work of eight men. It takes one man to run the machine. His work consists in sorting the coins, picking out plugged pieces, blanks, and buttons, which in some cases seem to get mixed with good money. The machine receives the sorted coins at one end, and delivers them all smoothly rolled in bunches to suit and with the wrapper pasted. It is the invention of a man whose business it was to collect coins from slot machines and to sort, count, and bundle them.

During the earthquake and fire at San Francisco, the trolley poles in the city were badly bent. How to repair this damage proved quite a serious problem. It was considered impractical to take out the poles, straighten them, and then replace them, and the other alternative of tearing them up and putting in new poles involved too much expense. The problem was finally solved by straightening the poles without removing them from their positions. The method of doing this, as described in a recent issue of the Electrical Railway Journal, is quite interesting. The apparatus used consisted of a 10-foot section of railway rail and two U bolts, with wooden fulcrum block. The rail was fastened to the upper end of the pole on the convex side of the bend by means of one of the U bolts, and then the lower end of the rail was forced inward against the pole by turning the nuts on the second U bolt. The cost of straightening the poles averaged about \$3.50 each, whereas if new poles had been used to replace the bent ones, the cost would have been \$40 each.

## SCIENCE.

Capt. Roald Amundsen's polar expedition is now assured, for the Storting has voted him a subsidy of \$18,000, necessary for the outfitting of Nansen's famous ship, the "Fram."

Under the new laws in effect in New York State, there are oculists, opticians, and optometrists. The optician seems to have lost importance, as the optometrist is one who ascertains and prescribes the character of the lens. The technical optician simply grinds the lens in accordance with directions from the optometrist and manufactures spectacles and eyeglasses. The oculist is a surgeon who treats the diseases of the eye.

The Navy Department, by its specifications for supplies to the fleet, has ranged itself against Dr. H. M. Wiley, chief of the Bureau of Chemistry of the Department of Agriculture, in his fight to prevent the use of benzoate of soda as a food preservative. In a specification issued on October 23rd last year for the supply of 600 gallons of tomato catsup, it is expressly stated that the only preservative to be used is benzoate of soda, and the proportions are left to be filled in by the firm bidding for the contract.

Prof. Florence has devised a new method of examining and photographing opaque microscopic objects. Applying this method to the examination of traces of blood on weapons, he was able to recognize distinctly red blood corpuscles which had escaped discovery by expert examiners. The method, which is susceptible of other than medico-legal applications, is characterized by the fact that the light by which the object is illuminated is admitted into the tube of the microscope, whence it is reflected by prisms to the object glass, which converges it upon the object.

In a system of construction laid before the 14th international hygienic congress, which met this year in Berlin, each story of a house projects from three to six feet beyond the story next above, and the width of the terraces thus formed is increased several feet by balconies. By this means every story is abundantly provided with light and air and also with an open space for outdoor recreation. The system is recommended especially for sanatoriums and dwellings for the poorer classes. As building material, reinforced concrete is indicated, for structural as well as hygienic reasons.

It is proposed to erect a monument in honor of Prof. E. J. Marey, who may be called the father of the moving picture. The cost of the monument is to be defrayed by international subscription. The International Association of the Marey Institute has already received the promise of many contributions from various countries. In France a committee, of which the minister of public instruction is the honorary president and M. Chareveau of the French Institute is the active president, has been formed for the purpose of soliciting and receiving contributions from the friends, admirers and former pupils of the deceased scientist. Contributions may be sent to M. Carvallo, Institut Marey, Boulogne-sur-Seine, or to the publishing firm of Masson et Cie., 120 Boulevard Saint-Germain, Paris.

The number of recognized asteroids is now 659, and it is not unlikely that 700 of these minute planets will soon be officially numbered and catalogued. Photography is reaping a rich harvest in this field, and hunting for asteroids is pursued almost as a sport by Metcalf, Palisa, Kopff, Lorenz, and other astronomers. At Arequipa, Peru, 17 known and 47 previously unknown asteroids were photographed between 1898 and 1901. It will be readily understood that the discrimination between known and unknown asteroids caught by photography entails long and arduous work, and it is not surprising that a long interval of time sometimes elapses between the making of the photographs and the definite enrollment of the asteroid as a new one or its identification with one already known. The swarm of little planets between the orbits of Mars and Jupiter is far from having been exhausted, and smaller and smaller members will be added with each improvement in methods and instruments.

Lunar rainbows are seldom observed in the temperate zone. Very likely the physical phenomenon occurs frequently but is invisible because of the faintness of the moon's light. On September 12th, 1908, an observer at Coxyde saw, to the northwest, over the sea, a band of light, striped horizontally but without perceptible color. The band moved slowly eastward and remained visible nearly all night. On the following day this observer learned that a lunar rainbow had been seen at the epoch of full moon, on September 10th. In the tropics, where moonlight is more intense, lunar rainbows are more frequently observed. They are by no means rare at Reunion Island. At all places the phenomenon is most frequently seen at full moon when the moon's light is highest, but it has been seen in various phases of the moon. It was first observed by Aristotle. A lunar rainbow is produced at full moon by the spray of the great Victoria Falls of the Yguassu, in Brazil.