THE SCIENTIFIC AMERICAN TROPHY FOR FLYING MACHINES HEAVIER THAN AIR.

The handsome silver trophy illustrated on this page was originated with the idea of stimulating the development of the science of aerial navigation. For many years past, and especially since the development of the dirigible balloon, the aim of all inventors in this line has been to construct a machine which would fly at a high rate of speed without the use of gas to support it. Nearly four years ago the Wright brothers, in this country, announced the successful application by them of a gasoline motor to an aeroplane, and the flight which they made upon December 19, 1903, is presumably the first one of any considerable distance which has ever been made by a motor-propelled aeroplane carrying a man. After two years of experimenting the Wright brothers finally announced that they had perfected their machine. No public demonstration has ever been made by them, however; and although, according to their own statements and those of eye-witnesses, they have solved the problem, still many people doubt this. At any rate, it is probable that progress in the new science will be made by others, and that in time there will be several kinds of heavier-than-air machines perfected. It is with the idea of encouraging inventors in this line by giving them a valuable object of art worth winning, that the SCIENTIFIC AMERICAN trophy has been completed and presented to the Aero Club of America. This club will hold annual competitions for the trophy, and, if it is impossible for an inventor to enter his machine in such competitions, he may obtain a special trial by arranging therefor with the club. The trophy is to be open to international competition, and any foreign competitor who wins it may take it to his native land, to be held by the aero club of which he is a member until it is won back by an American. In years to come the trophy may, therefore, be to aerial navigation what the "America" cup is to yachting.

In conducting the annual competitions for the trophy, the Aero Club of America will vary the conditions of winning it, in accordance with the progress that is being made with flying machines. In view of the fact that Santos-Dumont and other French experimenters have already flown considerable distances in a straight line with aeroplanes, it was decided that to win the trophy the first time, a competitor should be required to surpass these distances; and as there have been no prizes offered for a flight of one kilometer (3,280 feet) in a straight line, this distance was determined upon as the one required to be covered. Arrangements have been made to hold the first competition at the Jamestown Exposition on September 14, and two machines, at least, are expected to make a trial. Should the trophy be won at this or a subsequent contest this year, the conditions next year will be changed, so that a longer flight with turns will be required. The rules under which the present competition is to be held provide that no flight need be attempted if there is a wind of over twenty miles an hour, and also that the machines should be flown against the wind, if possible. Thus it will be seen that every opportunity will be given inventors to make a successful demonstration of their machines. Should any competitor win the trophy three times in separate years, it will become his property.

The trophy, as can be seen from the photograph which we reproduce, is a handsome piece standing 32 inches high and containing 218 ounces of silver. It commemorates Langley's aerodrome, which was the first motor-driven model aeroplane to make a successful flight of over half a mile. Prof. Langley's model made its first flight over the Potomac River May 6, 1896, and recent experiments with a full-sized machine of this type by Bleriot have shown that it possesses good stability, and is an altogether practical model. As Prof. Langley was the first man in this country to experiment with aeroplanes and to build a practical working model, we felt that both he and his machine should be commemorated; and it is for this reason that we have caused his model to be reproduced upon the trophy.

This new aeronautic trophy consists of a globe representing the firmament, and carrying on one side an aeroplane which is seen soaring through the clouds, illuminated from above by rays of sunlight. Some swallows are noticed vying with the aeroplane in flight, while in other places stars shine through the clouds. On the opposite side of the globe is modeled in relief the North American continent. The globe is carried on a whirlwind rising from a suitable pedestal, at the base of which, on each side, are three winged horses. The middle horse of each trio is mounted by a rider who holds aloft a palm branch. On top of the globe a large American eagle has just alighted with a wreath of victory in its beak.

No engraving can satisfactorily reproduce this beautiful piece of silver, which is a masterpiece of the silversmith's art. It has justly been called "The Blue Ribbon of the Air." We also illustrate the elaborately engrossed "Deed of Gift."

Deed of Gift
of the
Scientific American Trophy.

The Scientific American Trophy for heavier-than-air flying machines is offered for annual competition under the rules and regulations formulated and promulgated by the

Aero Club of America.

It is distinctly understood that the trophy is to be the property of the Club and not of the members thereof, except in the event that any one person shall win the trophy three times, in which case it is to become his personal property.

Should the trophy be won by the representative of some foreign Aero Club, it shall become the property of such Club, but it shall be subject to competition under the same terms and conditions as if it were still held by the Aero Club of America.

Should the holding Club, for any reason, be disbanded, the trophy shall revert to the donors, to be competed for, however, under the same terms and conditions as if it were held by the Aero Club of America.

The conditions under which the competitive tests and trials shall be made shall be determined by the Committee of Control of the Aero Club of America, and such conditions shall be made progressive in their severity of test, as far as possible, in order to foster and develop the progress of the art of aerial navigation.

Charles Allen Munn
President.
Frederick Converse Beach
Secretary and Treasurer

DEED OF GIFT MAKING OVER THE TROPHY TO THE AERO CLUB OF AMERICA.

THE SCIENTIFIC AMERICAN TROPHY FOR HEAVIER-THAN-AIR FLYING MACHINES.

"The Blue Ribbon of the Air" to be Competed for September 14, 1907, at the Jamestown Exposition. Height, 32 Inches.

Waste of Artesian Waters.

Millions of gallons of artesian waters are going to waste every day in Indiana, according to estimates made by F. G. Clapp, geologist of the United States Geological Survey, who is now investigating the water resources of the northern part of that State. Over a million gallons a day are wasted in a single county. Along Fall Creek, Lick Creek, White Run, and other streams, in the shallow valleys of which there are a great many flowing gas wells, each well pours out from 5 to 20 gallons of water a minute, and the amount of water thus drawn from the underground reservoirs and unutilized in Madison County alone is sufficient to supply a city of 10,000 inhabitants.

In only a few places is this water put to use. The farmers do not seem to realize that a hydraulic ram or a windmill placed on a flowing well will raise a large portion of the water to their houses on the hills above. Immense volumes of good water are therefore suffered to waste, and in this way the "head," or height of water in the wells, or the height to which it rises above the surface, has been lowered several feet. Many wells that once yielded copious and strong flows have ceased to flow entirely. By this means, also, the ground-water level in this region in ten years has been lowered over 10 feet.

This loss of head, not only in Indiana but in other parts of the country, has served to call attention to the fact that the available artesian supplies are by no means inexhaustible. Our "inexhaustible" supplies of natural gas and petroleum are rapidly being depleted, and the geologists and coal experts of the National Survey have computed with probable accuracy the date of exhaustion of our coal beds. Our "inexhaustible" forests are so dangerously threatened with speedy exhaustion that national legislation is now deemed necessary to protect them. The effect of deforestation on stream flow is at last well recognized. Since the forests of Indiana have been cut off the ordinary flow of many of the streams of the State has notably dwindled and the freshet flow is far more destructive.

The conservation of the artesian water supply should not be very difficult. By simply capping unused wells, or by providing them with such means of stopping and controlling their flow as is now applied to ordinary municipal supplies, the head of the wells can be preserved and the height of ground water maintained somewhat near its old level. Legislation may be required to accomplish this result, yet some of the students of the matter, and among them are geologists of the Survey, hope that an intelligent understanding of the conditions will lead to practical means to check this enormous waste and its consequent immense losses in values.

Shipbuilding in Germany during 1906 showed a marked increase over 1905, the gross registered tonnage of merchant vessels constructed, including ocean steamers, sailing vessels, river steamers, etc., having been 367,820 tons, as against 277,731 tons in the previous year. This represents an increase for the year of 32.4 per cent. The tonnage of war vessels constructed fell off from 30,630 to 23,671. At the close of the year 1906 there were under construction merchant vessels of various types aggregating 323,244 tons, and war vessels of a total of 72,444 tons.

The Russian cruiser "Rurik" on a preliminary trial easily kept up 21.5 knots.