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PROF. S. P. LANGLEY'S FLYING MACHINE.

have been in progress for some time past, a long series foot bridge crossing the Hudson River, we shall proof private trials having been conducted at Quan-bably retain for many a year a proud pre-eminence in tico, near Washington, D. C. An aluminum body con-this branch of engineering. tains the steam boiler and engine by which the spread is comprised within an area of eight by twelve, operation, it seems a wrong system to try to raise capiand descent.

tion and lightness. Many trials have been conducted, bridge across the British Channel is commenced. and, at last, the possibility of flight has been proved. A trial of the machine was made on December 13. and the aeroplane successfully accomplished a flight of three hundred yards. This was not the first flight.

indicate the possibility that we may yet see a success- discovery is one of great importance to naval engineers. ful aeroplane flying machine. We hope soon to have. It has long been known that hard metal projectiles particulars of the further trial trips.

THE HUDSON RIVER BRIDGE.

The insular situation of New York is one which is destined in the course of time to make it a city of the purpose of shattering the shots fired at it. The bridges. The East River between New York and present discovery, it will be seen, will probably work Brooklyn has been spanned, and already work is in a revolution in such methods. progress on a second bridge. But the great Hudson River is intact. An unfinished tunnel running part the discovery that if a thin sheet of soft wrought iron way under its bed marks the only actual attempt to be laid over a steel-faced armor plate, the latter failed break down its barrier. Over its surface a vast popu- to shatter a chilled steel projectile which had been lation is transported every day by ferryboats. The fired at it with great force. A similar combination was mouth of the Hudson is at New York City, and a most curious fact is that for many miles of the final portion projectile instead of to the steel armor plate. In the of its course the narrowest part of the river is at the subsequent experiments (which were carried out in city, Castle Point, Hoboken, N. J., and Fourteenth Russia) the capped projectile was found to penetrate Street, New York, marking the ends of the shortest plates against which the best Holtzer shot was comline which can be drawn across it within a very long pletely shattered. The caps were tried on a 6 inch distance.

Various companies have been organized to bridge the Hudson River, and we have illustrated the proposed structures. The construction of long span bridges has settled definitely into two types, the cantiable that the good results obtained were due largely lever and the suspension systems. The beautiful Brooklyn Bridge over the East River, between Brooklyn and this city, illustrates the perfection of the suspension called Russian "magnetic" shot, concerning which type, a type which always produces a graceful structure, the suspension cables tracing an approximate parabola in midair. The Forth Bridge is a monument cently carried out at the United States naval proving of the gigantic and the ugly, the disproportion be- ground at Indian Head, Maryland, with the same tween its cantilevers and connecting trusses being pri-result. marily responsible for its appearance.

It crosses the Firth of Forth at Queensferry, in Scotland, and has two main openings of 1,710 feet span each. It is to be hoped that no structure of this sort will be luvial deposits from overloaded streams has been disbuilt here. It would be a pity if the harbor of New covered by the government geological expedition on York, with the Statue of Liberty and the Brooklyn the Yahtse River, in Alaska. This river in its course Bridge, both objects of absolute beauty, were to have from the Chaix Hills to the sea passes through a tunsuch an infliction as the Forth Bridge. Fortunately : nel in the Malaspina glacier, some 6 or 8 miles in length. the action of the Secretary of War seems to prohibit it When it finally emerges into the open air it is a very for the present at least, as will be seen below.

federal control as far as legislation is concerned. The the river emerges from the ice it flows through a fordecision of the Secretary of War in the matter of the est of large trees, and the gravel and sand carried along construction of a bridge over the Hudson River has by the stream are deposited here to the depth of been published within the last few days. It was many feet. Some of the tallest trees still project elicited by the application for permission to build a through the deposit and retain their branches. The cantilever bridge across the stream by the New York greater part, however, have been broken off and comand New Jersey Bridge Company, the charter of the pletely covered up by the sand. In other places the company providing that their plans must be approved presence of vast forests is indicated by a few dead by the Secretary of War. The main point of the de- branches projecting through the deposits. In places cision is that the secretary forbids the construction of where the deposits are thickest all signs of the trees have any bridge except one of single span.

We have illustrated two plans of bridges proposed but broad sand flats. These are inundated in stormy for the purpose in question. One, the great Lillien- weather, and are of about the consistency of quick-15818 dahl suspension bridge (SCIENTIFIC AMERICAN, May sand. . 15827 23, 1891), was designed for a span of 2,920 feet, enough *** ution of o go clear across the water. The other, a cantilever onstruction (SCIENTIFIC AMERICAN, June 16, 1894), he question of the construction of the bridge. vill be a suspension bridge or nothing. ridges. For a while the United States, with the East game.

River Bridge, led the world; now Great Britain, with Experiments with Prof. Langley's flying machine its Forth Bridge, is in the van. When we have a 3,200

When we consider that for the above enormous sum machine is driven. The motive power is a pair of of money six or seven tunnels could be built under the screws or propeller wheels at the rear of the body. river bed, which would be superior in their operations These are rotated at very high speed and exert the en- to a bridge, as they would distribute trains with their tire propelling power. There are four aeroplanes, passengers along a considerable frontage of the river, with a maximum width of eight feet. The entire and which would be more quickly finished and put in feet. To direct its course to right or left there is a tal for the construction of the gigantic bridge, desvertical rudder, and the setting of the wings de-tined perhaps never to pay a dividend. Already termines its changes of elevation or of angle of ascent a tunnel has been carried two-thirds of the distance across the river. If this should be finished and It is unnecessary to say that everything about it is put in operation, the bridge might be relegated to constructed to secure the utmost perfection of opera- future generations-it might be postponed until the -----

Soft Caps on Conical Projectiles.

It has been proved recently that the penetrating power of conical projectiles may be greatly increased This, in connection with Maxim's work, goes far to by covering their ends with caps of soft metal. The are likely to be shattered on striking a plate of hard steel, thereby losing much of their force. Great efforts have consequently been made for years to provide the hardest possible surface for armor plates for

> The idea of capping the projectiles was suggested by effected by adding the soft metal to the head of the conical projectile, and it was found that the most effective plan was to cover the 6 inch conical projectile with a cap $4\frac{1}{2}$ inches long, having a thickness of $\frac{1}{2}$ inch at the apex and 1/8 inch at the edges. It is probto the lateral support given to the hardened point by the soft metal thimble. It is suggested that the sothere has been so much mystery, is merely a form of capped projectile. Similar experiments have been re-

A Forest Buried by Alluvial Deposits,

A remarkable instance of the rapid formation of alswiftly flowing stream of dark muddy water, 100 feet The Hudson River, as a navigable stream, is under wide and about 20 feet in depth. Near the point where disappeared and in their place nothing may be seen

tate of Main An interesting report on the distribution of wild game with a maximum span of 2,020 feet, requires a pier in in the State of Maine has been made recently by the he stream. The latter feature the Secretary of War State Fish and Game Commissioners. A remarkable as decided to prohibit. This decision follows an ex-increase of large game, such as moose, caribou, and austive investigation of the subject made by a deers, is reported. The number of those who hunt oard of engineers appointed for the consideration of this game has, however, increased fully twenty-five per cent during the year. The ruffled grouse, which are The reports state that a single span bridge of either still quite plentiful, are being rapidly decimated, and f the above types is safe. The distance between this is true for the most part of other forms of small earings is put at 3,100 feet. A cantilever of this span game. Fish culture as applied to land-locked salmon yould cost twice as much as the 2,000 foot one, while a has been very successful. Some forty fine lakes and uspension bridge of the larger span would cost but ponds were stocked with these fish during the year. ne-third more than the smaller cantilever. A sum of The value of fish and game interests to the State is 23,000.000 is estimated as sufficient for a six track sus-estimated at from \$3,000,000 to \$4,000.000. The comension bridge. The gist of the decision is that it mission ask for an appropriation of \$30,000 per annum for the next two years for carrying on the propagation There has long been a species of rivalry between end of fish and game. They also request that the State ineers, and even nations, involved in the magnitude of | be thoroughly supplied with wardens to protect the

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