Correspondence.

DR. LANGLEY'S FLYING MACHINE.

To the Editor of the Scientific American:

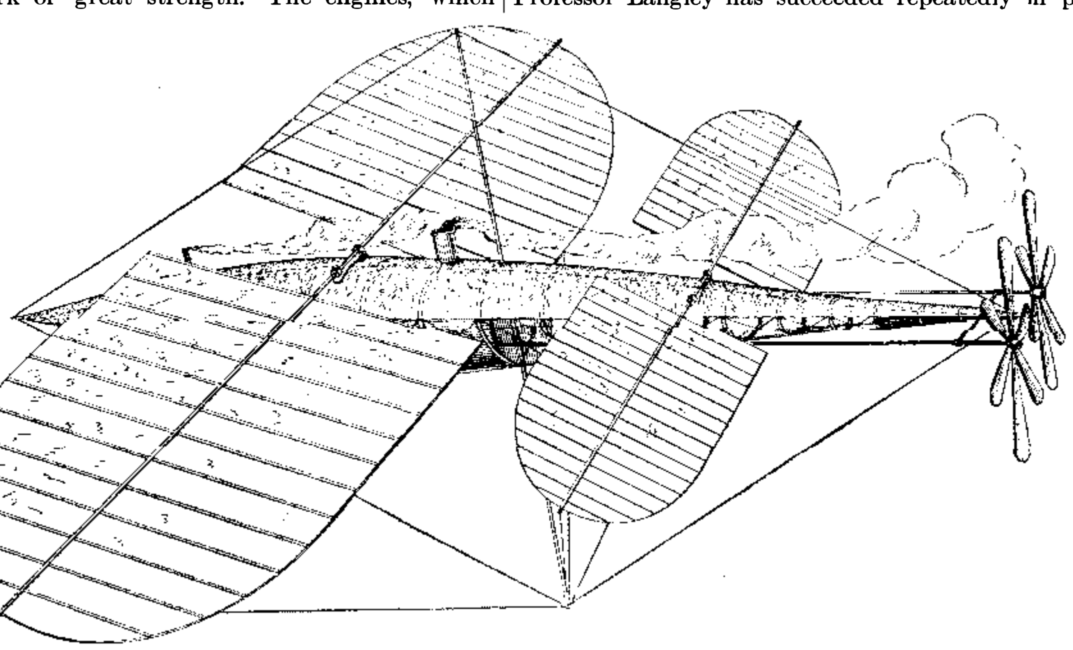
From the published descriptions of Professor S. P. Langley's flying machine the inclosed sketch is prepared. Of course it is not vouched for as to absolute accuracy, but conveys the general form of construction as stated in inclosed description taken from the daily press. The only apparent drawback to this particular method of aerial flight is in maintaining an upright position of the apparatus, free from the ground, until sufficient velocity is attained for soaring; and the means of alighting after flight. Other than the above mentioned difficulties (for which Professor Langley may have provided), the principle seems feasible, more especially when backed by so careful and competent authority. The article from which this sketch was prepared is as follows.

Ridgewood, N. J. H. E. MEAD.

[From the N. Y. *Herald*.]

It is stated that Prof. Samuel Pierpont Langley, the successor of Prof. Henry O. Baird in the control of the Smithsonian Institution, of Washington, which is under control of the government, has developed a flying machine which he believes is practicable. The machine is a working model. It is not intended to carry passengers. In configuration the body portion closely simulates a mackerel.

The backbone is a light but very rigid tube of what is technically known as "title metal," one of the many alloys of aluminum and steel. It is 15 feet in length and 5 centimeters (or practically 2 inches) in diameter. To give rigidity to the skeleton, longitudinal ribs of stiff steel are provided, intersected at intervals by cross ribs of pure aluminum, the result being a lattice framework of great strength. The engines, which



DR. LANGLEY'S FLYING MACHINE.

are located in the portion of the framework corresponding to the head of the fish, are of the double oscillating type. They weigh 60 ounces and develop one horse power—the lightest of that power ever made.

There are four boilers of thinly-hammered copper, weighing a little more than seven pounds each, and they occupy the middle portion of the fish. Instead of water, a very volatile hydrocarbon is employed, the exact nature of which is a matter of secrecy, but which vaporizes at a comparatively low temperature. The fuel used is refined gasoline, and the extreme end of the tail of the fish is utilized for a storage tank, with a capacity of one quart.

Before passing on to the boilers the gasoline is volatilized by going through a heated coil. There are twin screw propellers, which would be made adjustable to different angles in practice, to provide for the steering, but which in simply a working model are necessarily fixed at a certain point for a given trial.

Screws of various pitches and ranging from 20 to 80 centimeters in diameter have been experimented with, but it is not yet definitely determined which shall be adopted for trial. With the smallest the engines develop a speed of 1,700 revolutions a minute. With the larger ones the speed is somewhat decreased. A thin jacket of asbestos covers the upper portion of the body of the fish. It is unusually porous, and probably is employed to prevent undue loss of heat by radiation.

The wings, or aeroplanes, are sector-shaped and consist of light frames of tubular aluminum steel covered with China silk. The front one is 42 inches wide in the widest part and has an extreme length of 40 feet from tip to tip. The rear one is somewhat smaller. Both aeroplanes are designed to be adjustable with reference to the angle they present to the air. A tubular mast extends upwardly and downwardly through about the middle of the craft, and from its extremities run stays of aluminum wire to the tips of the aeroplanes and the ends of the tubular backbone, and by this trussing arrangement the whole structure is rendered exceedingly stiff.

The machine was constructed and perfected to its present degree in a secret room in the Smithsonian Institution, where it now rests. It was conceived about twenty months ago by Professor Langley, who associated with him in the work of experimentation Chief Clerk W. C. Winlock and Dr. Kidder, a scientific expert, employed at that time in the institution. Four skilled workmen in mechanics and metallurgy were put to work at fifty cents an hour under pledge of secrecy. The work went on at odd hours, mostly at night and on Sundays.

At the institution the strictest injunctions were laid on the watchmen to keep all intruders off the scent. The watchmen themselves were instructed to turn their backs or walk to the other end of the corridor when word was passed from the chief that some article was to be conveyed to or from the secret chamber. It is said that one employe was discharged merely for being seen on the third floor of the building. None of the regular employes were supposed to know what was going on there. As a matter of fact, very few of them do know that anything is there at the present time.

Professor Langley went to France to personally superintend the making of the central tube, which constitutes the backbone of the structure, and brought it back with him among his personal effects to insure careful handling. It is so light that it can be handled easily by an infant. During his French visit, while in touch with the most advanced investigators, he is believed to have reached his conclusion as to the best model for the general conformation of the proposed air craft—namely, the long, thin tapering lines of the mackerel.

In the large lecture room of the National Museum Professor Langley has succeeded repeatedly in producing successful flights by small models. They would fly as long as the power lasted, the power being applied by means of lightly wrapped rubber bands on the principle of the string top. The lightest of these little models weighs 16 grammes and will soar from one end of the room to the other as freely as a bird. It may be supposed that the gross weight has been so far reduced as to give hope of actual success now, inasmuch as an outdoor trial has been planned.

The intention is to employ a tug to tow the experimental party to a creek about 45 miles down the Potomac, where the experiments may be conducted without fear of interruption.

That 212½ Tons of Pig Iron.

To the Editor of the Scientific American:

I do not wonder that the statement of J. E. Emerson is doubted. But Mr. Andrews does not know what kind of a man Mr. Emerson was in his young days. Let me tell a little story about him.

In 1882 I was talking to a Mr. Carter, of Indianapolis, Ind., and he told me the following: "In the early days of California I owned a saw mill up in the mountains. One day a man came to me about the middle of the afternoon. He had a packon his back, which I weighed and found to weigh 80 pounds. It was made up of hammers, straight edges, and inserted saw teeth blanks. On inquiry I found he had traveled over 40 miles that day over the mountains, afoot, and carried 80 pounds on his back. He wanted to insert teeth in my saw. After some talk he agreed to do the work and take an old broken saw I had for his pay. It was of no use to him, but there were quite a number of mills in the neighborhood, and it would be a good advertisement for him to get one running in my mill. I told him to go ahead. He went into my little blacksmith shop and went to work. He never stopped work from about 4 o'clock in the afternoon until 10 the next morning. Worked all night long. He had to file out the places in the saw where the teeth went in, and you know that is hard work. The result was that he got work in all the mills in the neighborhood. As he had walked to my mill 40 miles over the mountains and carried 80 pounds on his back, I did not have the cheek to pay him with a useless saw, but paid him in gold. That man was your father, J. E. Emerson." Now a man that could walk 40 miles over mountain roads with 80 pounds of steel on his back, and then work hard for 18 hours, mostly at night, is capable of handling 212½ tons of iron a day. I know of several other just such tricks as these that Mr. Emerson has done. It simply shows what Maine Yankees of those early days were made of. C. M. EMERSON.

Eau Claire, Wis., April 5, 1893.

The Lur.

To the Editor of the Scientific American:

Your issue of the 1st inst. contains a most delightful and readable account from a Danish correspondent of the "lure." Few of your readers can realize what an untold array of tradition, folk lore, anecdote and actual history the instrument in question stands for among the sons and daughters of the high north of Europe. What I desire more especially to call attention to in the premises is the fact, or apparent fact, of an early and remarkably high artistic evolution of the lure, as proved by the workmanship of the samples now in possession of the National Museum, Copenhagen; while yet the primitive instrument, the birch lure, from which it evidently grew, is still in daily use during the summer months, more especially among the Alpine meadows in western Norway. Deduct the curved neck of the instrument and also the wide semi-oblong mouth of the same, and what remains is the exact form of the lure as it is in use among the peasants of the western mountain regions in old Norway to-day, and has been for thousands of years, except that it is made of birch bark instead of metal, as are the Danish instruments.

The office of the lure among the peasants is largely that of soothing the cattle herds and calling them together in the evening, precisely as the cowboy does on the plains at night. He rides in a circle, gradually narrowing into a "round-up." The cattle lie down and drop off into rest and slumber under the witchery of a human voice known to them. The cattle of the Norse peasant are collected together in two or three small herds, the property of so many different families, and in June they are sent up into the Scandinavian Alpine meadows, which are no sooner bare of snow than the daily twenty hours sunshine and the twenty-four hours daylight covers every single square foot below the glaciers with the most nutritious and juicy grass sward.

No matter how feeble before arrival, they grow rapidly fat there. They are in charge of the oldest peasant girls of the respective families that own the cattle, but they do not herd them; they go loose very largely. They are there to milk the cows and to convert the dairy products into butter and cheese. It is in the evening, when the herd is recalled from the surrounding pastures, that the lure comes into play again. Many of the girls become quondam artists in its use, and manage to evoke a good deal of music from the primitive instrument.

It has, however, also a purely romantic use, more especially among the high-spirited peasants of the Trondheim districts of northern Norway. When a peasant girl has an engaged swain at work on the home farm he is supposed to be on the lookout for a lure signal from his prospective bride at any time, but more especially so on the Sabbath morning. Selecting the most commanding peak above the valley, in sight of the home farm, she seats herself on its summit at sunrise—that is between half past three and four A. M.—sending down over beetling crags and canons the choicest lure selections she is capable of. It is a challenge to her lover's devotion and punctualness, and woe to him if a prompt and melodious reply on the home lure is not at once forthcoming. She is then entitled, if she sees fit to demand it, to have the whole courtship renewed; at any rate, some act of penance must not be long delayed.

One of the most charming compositions ever written by the magician of the violin, Ole Bull, is the "Saeter Jentens" Sunday. The "Saeter" implies the mountain meadows, "Jenten" is the peasant word for an unmarried girl. No one that ever heard the wonderful strains but would catch, as in clear vision, the imposing grandeur of a scenery equal in power to and greater in magnitude from the Alps of Switzerland—a sunshine and an air as sweet and gentle as though it were the first morning of completed creation; while through it all came the echo of the lure, tender as the voice of the first meadow larks in spring. Such are a very few of the memories awakened by your interesting reminiscences of the Danish metal lure. Old-fashioned as seems the birch lure by comparison, I trust I have given you a few reasons why the mother instrument still holds its own. OLAF ELLISON.

Los Angeles, Cal., April 6, 1893.