means — by small steam jets or by the evaporation of water. It is sometimes covered with cloths during this stage to prevent drying too rapidly. The rest is a retarding process, and is intended to prevent the surface of the macaroni from drying too fast, and to allow the interior to harden. If the macaroni is not allowed to rest at this stage, it is liable to crumble or split. From the resting rooms it is carried to large spacious rooms that have thorough ventilation, either natural or artificial. It is estimated that for each man employed in the steam factories, about 170 to 200 pounds are produced per day.

REMARKS ON AN ACT FOR THE PREVENTION OF BLINDNESS.[1]

"SECTION 1. Should one or both eyes of an infant become reddened or inflamed at any time within four weeks after its birth, it shall be the duty of the midwife, nurse, or person having charge of said infant, to report the condition of the eyes at once to some legally qualified practitioner of medicine of the city, town, or district in which the parents of the child reside.

"Section 2. Any failure to comply with the provision of this act shall be punishable by a fine not to exceed one hundred dollars, or imprisonment not to exceed six months, or both.

"Section 3. This act shall take effect on the first day of June, eighteen hundred and ninety-one."

This act for the prevention of blindness was passed by the last legislature [of Maine], and was signed by the Governor, March 28. The legislature of New York passed an act similar to this one last year, and was the first State to have a law of this nature upon its statute books. Maine follows the lead and has the honor of being the second State in the Union to have such a law.

It is intended to draw attention more forcibly to purulent inflammation of the eyes, known also as ophthalmia neonatorum or purulent inflammation of the new-born. This disease is always caused by contagion or infection. It will be seen at once that it can be placed among the preventable diseases, and therefore the prophylactic treatment is one of the most important and satisfactory problems in hygiene, because in a large majority of cases the disease can be prevented from spreading. If, however, the disease does spread, and is recognized upon its first appearance, we possess remedies that can be applied by any physician and the disease can be cured at once. It would seem, therefore, that we need some law to call attention to the importance of the early treatment of the infant's eyes that blindness may be prevented, for every blind person represents a certain loss of productiveness to the State, and many are throughout their lives dependent upon relatives or the public for support.

If from twenty to thirty per cent of blindness in the State is due to neglect of proper treatment of this disease, all will agree that it is time something was done to place the neglect of such treatment upon some responsible person. This act for the prevention of blindness will do another good thing by calling attention to the prophylaxis of this disease. Proper treatment will be instituted before and after the birth of the infant in order that the eyes may not become infected, and thus the sight of many will be saved. To indicate how efficient this treatment is, it might be mentioned that after Credé had devised his method of prophylaxis for this disease, he had only two cases in 1,600 infants, whereas, before he practiced his method he had 10,8 per cent of the infants affected with it, which in this instance would be equal to 160 infants, some of whom would become blind in spite of the best treatment then known. By Credé's method of prophylaxis and treatment for this disease no infant need become blind. This means the prevention of an enormous amount of misery and the saving of an enormous amount of productive energy in the United States, estimated at not less than $7,500,000 each year. This enormous loss of wealth to the United States is due to the ravages of a disease as surely preventable as any in medicine. Dr. Burnett of Washington estimates that the disease costs the country more in ten years than all the epidemics of yellow-fever and cholera for the past hundred years.

Dr. E.E. Holt of Portland, Me., in The Sanitary Inspector.

To itemize this account, we find that the cost of keeping a single blind person in our best managed institutions is $132 a year. This makes the cost of sustenance of our blind from this one disease alone about $2,000,000. If we add to this sum what these blind persons would produce if they were not dependents, and reckon their productive wealth at $1.00 per day on an average, we have the enormous sum of $7,500,000. Maine having about one-fiftieth of the blind of the United States shares about one-fiftieth of the misery and loss of productive energy from this disease, which equals $150,000, according to this estimate.

It is our duty to do something to prevent this misery and loss to the State. At the clinic of the Maine Eye and Ear Infirmary many of the bad results of this disease are seen, persons crippled for life, and these defects of the eye are classified under various names giving little or no idea of their origin. These clinics remind one, like those of similar institutions, that not one-half of the misery or loss of productiveness is represented by those who have lost their sight from this disease, for where one has been made blind by it many have been more or less seriously affected in one or both eyes, so that the course of their lives has been changed from one of probable comfort and usefulness to a miserable existence. The statistics do not include this numerous class of persons. But they, as well as those who have been made blind from this disease, appeal to our better nature to do something for them. It will need but a short time to cure the affection if the infant is brought, on the first appearance of the disease. We are backward in this country as compared with some European countries.

In London there is a society for the prevention of blindness which does good work by directing attention more forcibly to the causes which produce this unfortunate disease.

The Ophthalmological Society of the United Kingdom, which is composed of the ablest men from all parts of England, Ireland, and Scotland, took up this subject in 1884, and appointed a committee of the leading men of the society, who unanimously reported that it was a subject for governmental interference.

In Germany, France, and Switzerland stringent regulations have been adopted, which demand of the nurse or person having charge of an infant to report any reddened or inflamed condition of the eyes at once. Three years ago the American Ophthalmological Society appointed a committee to investigate this subject and make a report, which they did last year. They recommended that each member of the society do all he could to have laws enacted that would call the attention of the public, and particularly of those having charge of infants, to the great importance of early treatment of the eyes, should any inflammatory symptoms arise.

EXPERIMENTAL RESEARCHES ON MECHANICAL FLIGHT.

THE following is a translation of a communication made by Professor S. P. Langley to the Paris Academy of Sciences on July 13, and published in *Nature* of July 23: —

I have been carrying out some researches intimately connected with the subject of mechanical flight, the results of which appear to me to be worthy of attention. They will be published shortly in detail in a memoir. Meanwhile I wish to state the principal conclusions arrived at.

In this memoir I do not pretend to develop an art of mechanical flight; but I demonstrate that, with motors having the same weights as those actually constructed, we possess at present the necessary force for sustaining, with very rapid motion, heavy bodies in the air; for example, inclined planes more than a thousand times denser than the medium in which they move.

Further, from the point of view of these experiments and also of the theory underlying them, it appears to be demonstrated that if, in an aerial movement, we have a plane of determined dimensions and weight, inclined at such angles and moving with such velocities that it is always exactly sustained in horizontal flight, the more the velocity is augmented the greater is the force necessary to diminish the sustaining power. It follows that there will be increasing economy of force for each augmentation of velocity,

up to a certain limit which the experiments have not yet determined. This assertion, which I make here with the brevity necessary in this *résumé*, calls for a more ample demonstration, and receives it in the memoir that I have mentioned.

The experiments which I have made during the last four years have been executed with an apparatus having revolving arms about twenty metres in diameter, put in movement by a ten horse-power steam-engine. They are chiefly as follows.

(1) To compare the movements of planes or systems of planes, the weights, surface, form, and variable arrangements, the whole being always in a horizontal position, but disposed in such a manner that it could fall freely.

(2) To determine the work necessary to move such planes or systems of planes, when they are inclined, and possess velocities sufficient for them to be sustained by the reaction of the air in all the conditions of free horizontal flight.

(3) To examine the motions of aerostats provided with their own motors, and various other analogous questions that I shall not mention here.

As a specific example of the first category of experiments which have been carried out, let us take a horizontal plane, loaded (by its own weight) with 464 grams, having a length 0.914 of a metre, a width 0.102 of a metre, a thickness two millimetres, and a density about 1,900 times greater than that of the surrounding air, acted on in the direction of its length by a horizontal force, but able to fall freely.

The first line below gives the horizontal velocities in metres per second; the second the time that the body took to fall in air from a constant height of 1.22 metres, the time of fall in a vacuum being 0.50 of a second.

Horizontal velocities..	0 m.,	5 m.,	10 m.,	15 m.,	20 m.
Time taken to fall from a constant height of 1.22 metres.....	0.53 s.,	0.61 s.,	0.75 s.,	1.05 s.,	2.00 s.

When the experiment is made under the best conditions it is striking, because, the plane having no inclination, there is no vertical component of apparent pressure to prolong the time of fall; and yet, although the specific gravity is in this more than 1,900 times that of the air, and although the body is quite free to fall, it descends very slowly, as if its weight were diminished a great number of times. What is more, the increase in the time of fall is even greater than the acceleration of the lateral movement.

The same plane, under the same conditions, except that it was moved in the direction of its length, gave analogous but much more marked results; and some observations of the same kind have been made in numerous experiments with other planes, and under more varied conditions.

From that which precedes, the general conclusion may be deduced that the time of fall of a given body in air, whatever may be its weight, may be indefinitely prolonged by lateral motion, and this result indicates the account that ought to be taken of the inertia of air, in aerial locomotion, a property which, if it has not been neglected in this case, has certainly not received up to the present the attention that is due to it. By this (and also in consequence of that which follows) we have established the necessity of examining more attentively the practical possibility of an art very admissible in theory — that of causing heavy and conveniently disposed bodies to slide or, if I may say so, to travel in air.

In order to indicate by another specific example the nature of the data obtained in the second category of my experiments, I will cite the results found with the same plane, but carrying a weight of 500 grams, that is 5,380 grams per square metre, inclined at different angles, and moving in the direction of its length. It is entirely free to rise under the pressure of the air, as in the first example it was free to fall; but when it has left its support, the velocity is regulated in such a manner that it will always be subjected to a horizontal motion.

The first column of the following table gives the angle (α) with the horizon; the second the corresponding velocity (V) of *planement* — that is, the velocity which is exactly sufficient to sustain the plane in horizontal movement, when the reaction of the air causes it to rise from its support; the third column indicates in grams the resistances to the movement forward for the corresponding velocities — a resistance that is shown by a dynamometer. These three columns only contain the data of the same experiment. The fourth column shows the product of the values indicated in the second and third — that is to say, the work T, in kilogram-metres per second, which has overcome the resistance. Finally, the fifth column, P, designates the weight in kilograms of a system of such planes that a one horse-power engine ought to cause to advance horizontally with the velocity V and at the angle of inclination α.

α	V	R	$T = \frac{VR}{1000}$	$P = \frac{500 \times 4554}{T \times 60 \times 1000}$
45	11.2	500	5.6	6.8
30	10.6	275	2.9	13.0
15	11.2	128	1.4	26.5
10	12.4	88	1.1	34.8
5	15.2	45	0.7	55.5
2	20.0	20	0.4	95.0

As to the values given in the last column, it is necessary to add that my experiments demonstrate that, in rapid flight, one may suppose such planes to have very small interstices, without diminishing sensibly the power of support of any of them.

It is also necessary to remark that the considerable weights given here to the planes have only the object of facilitating the quantitative experiments. I have found that surfaces approximately plane, and weighing ten times less, are sufficiently strong to be employed in flight, such as has been actually obtained, so that in the last case more than 85 kilograms are disposable for motors and other accessories. As a matter of fact, complete motors weighing less than five kilograms per horse-power have recently been constructed.

Although I have made use of planes for my quantitative experiments, I do not regard this form of surface as that which gives the best results. I think, therefore, that the weights I have given in the last column may be considered as less than those that could be transported with the corresponding velocities, if in free flight one is able to guide the movement in such a manner as to assure horizontal locomotion — an essential condition to the economical employment of the power at our disposal.

The execution of these conditions, as of those that impose the practical necessity of ascending and descending with safety, belongs more to the art of which I have spoken than to my subject.

The points that I have endeavored to demonstrate in the memoir in question are —

(1) That the force requisite to sustain inclined planes in horizontal aerial locomotion diminishes, instead of increasing, when the velocity is augmented, and that up to very high velocities, — a proposition the complete experimental demonstration of which will be given in my memoir; but I hope that its apparent improbability will be diminished by the examination of the preceding examples.

(2) That the work necessary to sustain in high velocity the weights of an apparatus composed of planes and a motor may be produced by motors so light as those that have actually been constructed, provided that care is taken to conveniently direct the apparatus in free flight, with other conclusions of an analogous character.

I hope soon to have the honor of submitting a more complete account of the experiments to the academy.

OLD STANDARDS.

By a curious accident it has just been discovered that the standard yard and certain other measures and weights which were supposed to have been lost when the Houses of Parliament were destroyed by fire in 1834 are still in existence. The following account of the matter, condensed from a statement in the London *Times*, is given in a recent issue of *Nature*.

A reference to the contemporary records shows that after the fire the standard bars of 1758 and 1760 were both found among the ruins, "but they were too much injured to indicate the measure of a yard which had been marked upon them." The principal