SCIENCE:

A WEEKLY NEWSPAPER OF ALL THE ARTS AND SCIENCES

PUBLISHED BY

N. D. C. HODGES,

47 LAFAYETTE PLACE, NEW YORK.

SUBSCRIPTIONS.—United States and Canada.....$3.50 a year.
Great Britain and Europe..... 4.50 a year.

Communications will be welcomed from any quarter. Abstracts of scientific papers are solicited, and one hundred copies of the issue containing such will be mailed the author on request in advance. Rejected manuscripts will be returned to the authors only when the requisite amount of postage accompanies the manuscript. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a guaranty of good faith. We do not hold ourselves responsible for any view or opinions expressed in the communications of our correspondents.

Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

THE PREPARATION OF MACARONI IN ITALY.

MACARONI is the *semoule*, or flour of wheat, moistened with water, kneaded until it assumes the requisite consistency, cut or pressed into the desired shape, and thoroughly dried. When wheaten flour is agitated in a large quantity of water, the starchy substances are dissolved, leaving a tough fibrous mass, which is gluten. Gluten contains nitrogen, while starch does not; hence the *semoule* or flour that contains the most gluten is the most nutritious. As compared with gluten, starch has but little strength; hence macaroni that is rich in gluten is not only the most nutritious, but is stronger, thereby preserving its shape while being dried and cooked.

The United States Consul-General at Rome says that for the best macaroni, the hard, semi-translucent varieties of wheat grown in warm countries, which contain a large proportion of gluten, are used in the form of *semoule;* for the cheaper grades common flour is used. Any intermediate grade can be made by mixing the two in various proportions. There are no statistics giving the quantity of macaroni made in Italy; but, as it constitutes one of the chief articles of food, the quantity must be exceedingly great. There are many large establishments manufacturing it by steam-power, and probably many thousands worked entirely by hand-power, and employing from three to five or six hands each. It is also an article of daily household production in a large proportion of Italian families. In the household the appliances are exceedingly simple — a smooth board, a piece of marble for kneading, and a common rolling-pin. One pound of flour is mixed with four or five eggs, moistened with hot water, kneaded a few minutes, and then rolled out very thin with the rolling-pin. After drying on the kneading-board for fifteen or twenty minutes, until the surface loses its adhesiveness, it is rolled up tightly, and thin slices are cut from the ends. The slices falling apart constitute strings of macaroni, and are ready for use. The macaroni factory which is worked by hand often consists of but one room, exclusive of the drying-rooms. The proprietor, with one or two workmen, makes the macaroni, and the wife sells it. The machinery is inexpensive, and the hired labor costs but little.

Artificial heat is seldom employed for drying, but the manufacture is often carried on in connection with the baking business. In this case, the drying-rooms would be above the ovens, and warmed somewhat by the waste heat. The result is, that these small establishments can successfully compete with the larger factories that are worked by steam-power. Their machinery generally consists of a mixer, a kneader, and a press. The mixer may be described as a semi-circular trough, having a hinged cover. Through the trough runs an iron shaft, having a number of projecting arms, with a crank on one end. About one hundred pounds of *semoule* or flour, or a mixture of both, according to the quality of the macaroni desired to be produced, is placed in wooden troughs, that stand in front of the mixer. To this is added a sufficient quantity of water, at about 160° F., containing in solution a small quantity of saffron, to give the macaroni the desired color. It is then mixed by hand for a few minutes, in order to fairly distribute the water, after which it is put into the mixer. The lid being closed, a workman turns the crank for about twenty minutes, when the contents are found to be converted by the action of the arms attached to the crank shaft, into a stiff dough.

From the mixer the dough is taken to the kneading-table. This is made in a number of ways. One of the most common in the neighborhood of Rome consists of a kneading-plank about forty inches long, thirty-two inches wide at the inner end, and forty inches at the outer end, with sides to keep the dough from falling out. It is solidly made of hard wood two and a half to three inches thick, and firmly attached to the floor and wall. The kneading is generally done by two or three men with a long bar attached by a swivel joint to the wall at the back of the table. This bar is about sixteen feet long, ten inches deep next to the wall, and three inches at the other end. The part next to the dough is bevelled to the shape of a blunt wedge with a rounded edge. The bar is worked up and down on the dough, and being fastened at the end exerts a tremendous and crushing force. Being made of a tough, elastic wood, it both readily sustains the full weight of the men when pressed down, and springs back above the dough sufficiently to allow it to be moved a little, and brought down on another part. This kneading continues for about twenty-five minutes, when the dough is ready for the press.

In some places the table is a straight plank about eight to ten feet long and fifteen inches wide, with sides to hold the dough in position The kneading is done by means of a drum about four feet in diameter, and the width of the plank. It is worked backwards and forwards by means of an upright capstan, about twelve inches in diameter, with a rope coiled round it and around suitable mechanism on the drum.

As soon as the dough is in a suitable condition, it is taken to the press, which consists chiefly of a cylinder about eight to ten inches in diameter, and twenty to twenty-four inches long, a plunger that fits the interior accurately, and a die plate that rests on a shoulder cast on the lower portion. The plunger is forced down by a screw, which is suitably connected, by working with a crank by hand. While one man mixes the dough, another turns the crank to press it, and the third takes the macaroni as it leaves the dies, cuts it into suitable lengths, and hangs it on light cane or bamboo sticks about five or six feet in length, ready to be carried to the drying-room. The press is heated to about 160° F. by means of a small pot of live coals, which is placed inside the cylinder a few minutes before pressing begins. From the presses the long macaroni is carried on light bamboo sticks to the drying-rooms. The small and fancy shapes are dried on screens. These are wooden frames about two feet by six, covered with a coarse cloth, so as to allow the air to freely circulate. A brace across the middle of the frame serves as a handle. The small and fancy macaroni is made in horizontal presses. Cutters revolving more or less rapidly near the face of the die, according to the length required, cut it into any desired length. The speed of the cutters is regulated by a pair of cone pulleys.

The drying of the macaroni is the most difficult and delicate part of the manufacture, and depends much upon the state of the atmosphere. It is first dried in the open air, the time in the sun or shade depending on the temperature and dryness of the atmosphere, from half an hour to three hours; the time also depends to some extent on the size of the macaroni. It is then carried to a close damp room, where it remains about twenty-four hours. If the room is not sufficiently damp it must be kept so by artificial

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,