Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S., Canada or Mexico.....$3 00
One copy, six months, for the U. S., Canada or Mexico..... 1 50
One copy, one year, to any foreign country belonging to Postal Union. 4 00
Remit by postal or express money order, or by bank draft or check.
MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, $5.00 a year, for the U. S., Canada or Mexico. $6.00 a year to foreign countries belonging to the Postal Union. Single copies 10 cents. Sold by all newsdealers throughout the country. See prospectus, last page.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, to one address in U. S., Canada or Mexico, on receipt of *seven dollars*. To foreign countries within Postal Union *eight dollars and fifty cents a year.*

Building Edition.

THE ARCHITECTS AND BUILDERS EDITION OF THE SCIENTIFIC AMERICAN is a large and splendid illustrated periodical, issued monthly, containing floor plans, perspective views, and sheets of constructive details, pertaining to modern architecture. Each number is illustrated with beautiful plates, showing desirable dwellings, public buildings and architectural work in great variety. To builders and all who contemplate building this work is invaluable. Has the largest circulation of any architectural publication in the world.

Single copies 25 cents. By mail, to any part of the United States, Canada or Mexico, $2.50 a year. To foreign Postal Union countries, $3.00 a year. Combined rate for BUILDING EDITION with SCIENTIFIC AMERICAN, to one address, $5.00 a year. To foreign Postal Union countries, $6.50 a year. Combined rate for BUILDING EDITION, SCIENTIFIC AMERICAN and SUPPLEMENT, $9.00 a year. To foreign Postal Union countries, $11.00 a year.

Spanish Edition of the Scientific American.

LA AMERICA CIENTIFICA E INDUSTRIAL (Spanish trade edition of the SCIENTIFIC AMERICAN) is published monthly, uniform in size and typography with the SCIENTIFIC AMERICAN. Every number of *La America* is profusely illustrated. It is the finest scientific, industrial trade paper printed in the Spanish language. It circulates throughout Cuba, the West Indies, Mexico, Central and South America, Spain and Spanish possessions—wherever the Spanish language is spoken. $3.00 a year, post paid to any part of the world. Single copies 25 cents. See prospectus.

MUNN & CO., Publishers,
361 Broadway, New York.

☞ The safest way to remit is by postal order, express money order, draft or bank check. Make all remittances payable to order of MUNN & CO.

☞ Readers are specially requested to notify the publishers in case of any failure, delay, or irregularity in receipt of papers.

NEW YORK, SATURDAY, NOVEMBER 17, 1894.

Contents.

(Illustrated articles are marked with an asterisk.)

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 985.

For the Week Ending November 17, 1894.

Price 10 cents. For sale by all newsdealers.

THE PREVENTION OF NOISE.

The nineteenth century can be no better defined than as a century of wonders. The wealth of mechanical and scientific invention which has been lavished upon it has made it a veritable miracle. The true progress of the last fifty years has been such as to actually affect the popular mind, which now has reached a condition when it is hardly susceptible of further wonder. The long distance telephone was as quietly accepted as was its predecessor—the original magneto telephone. Telegraphing from trains moving at sixty miles an hour by induction through the air was tried, proved successful, and was abandoned from business motives, but it excited but a passing wonder in the public. The trolley car is used daily by multitudes of people, but few of whom ever stop to think of the wonderful achievement of the transmission of hundreds of horse power over an inert copper wire.

But the great increase in mechanical appliances and the growth of population in cities has brought about a disagreeable effect, the increase of noise. From the private office, where the rattle of the typewriter has proved the successor to the classic squeaking of the quill pen, to the street, where the traffic of carriages and carts is overtopped by the roar of the elevated railroad, our life is spent in the midst of noise. It would seem that not one field but a hundred or more fields are open to the inventor who will attack the noise problem in its minor as well as major phases. When a machine, in addition to doing its work, produces noise, the latter is pretty certain to be the indication of a useless expenditure of energy if not directly the cause of such waste.

When the elevated roads were first put into operation in New York, the noise was a source of the greatest complaint. Residents near the road, not only on the streets through which it passed, but within a block of it, were among the protestors against the constant disturbance produced by the passage of trains. The medical profession was appealed to, and joined in the protest. There were rumors of inventions to prevent it, experts were engaged to analyze the sound constituents, the people got accustomed to it, and to-day the sound is as loud or louder than ever.

Of all ordinary means of rapid transit, the elevated roads are undoubtedly the most agreeable for the passengers. Underground roads of whatever type are unpleasant. Even the use of electric propulsion does not completely solve the ventilation problem, and the absence of daylight is an objection. But to others than the passengers the elevated railroad is not so agreeable. There is little doubt that a successful invention for preventing the noise would be an improvement of the highest order. The problem might be attacked through different avenues. The wheels might be so modified as to stop the annoyance. If India rubber tires could be successfully used, the trouble would be alleviated.

As the wheels pound over the rails, the entire structure for a considerable distance shares in the vibration, and by conduction and by its own resonance adds to the sound. A soundless structure would effect the remedy. The cure might be applied as near the rail as possible, with the idea of cutting off the structure from the seat of disturbance, between the rail and wheel.

Nature has given a hint as to how the sound might be diminished in volume; after a heavy snow storm it is greatly reduced, the snow exercising a muffling effect. This indicates, at the least, the possibility of taking the whole structure in hand and of making it non-resonant, so that it would not respond to the rolling of the wheels on the rails.

Streets paved with stone have proved so noisy that city authorities are doing all in their power to replace stone blocks by something better. Asphalt in sheet or in blocks and vitrified brick in a measure decrease the sound due to vehicles. Carriage makers, in applying India rubber tires to carriage wheels, do a great service of the same order.

The whole circle of modern city life can be traversed and everywhere will be found opportunities for the abolishment of one or the other element of the city's roar. What mankind really does is to sit down and endure until accustomed. It would seem more in accordance with enlightened ideas to apply a cure to the disease rather than to learn to bear its presence.

Military Pigeons.

Major Giddings, U.S.A., has an interesting little article in the October number of Outing, on Naval Messenger Pigeon Service, and from it the following facts were gleaned: Pigeons have been used for military service since the Franco-Prussian war. France, Germany, Austria, Italy, Spain, and Portugal now have completely organized pigeon posts; some of the nations owning upward of 600,000 birds. The United States pigeon service only covers a period of three years, the principal naval pigeon station being at the Naval Academy at Annapolis, Maryland, with branches on the cruiser New York and U. S. P. C. Constellation. The intention is to extend the system until the whole Atlantic coast is covered. The plan being to have twelve main and seven secondary stations reaching from Portland, Maine, to Galveston, Texas. Speaking of how the birds are enabled to find their way home, Major Giddings says:

"The common belief that these birds find their way home by instinct is a mistake. Their flight is guided by sight alone. When a pigeon is liberated, it rises to a great height in the air in constantly enlarging circles until it catches sight of some familiar landmark by which to direct its course. When liberated from a balloon at too great a height for objects to be seen upon the earth by even its piercing vision, it drops like a plummet until it nears the earth, when it begins to wheel around in a descending spiral until it finds its bearings."

The average speed of these messenger birds is given at thirty miles an hour, and the writer thinks they will prove of the greatest service both in times of war and peace. Pigeon fanciers will find the article well worth a careful perusal.

The Growth of Boston, Mass.

The City Surveyor of Boston, Mass., Mr. Pierre Humbert, Jr., has recently published a report devoted largely to the present and possible conditions of the water front of that city, which is attracting much attention there. This report is accompanied by reproductions of some old maps of the city which are in themselves of much value to any student of municipal problems. The first of these maps is a fac-simile of one published in 1729, showing the territory and street surfaces upon which the commerce of the old town was conducted, and a second map, a fac-simile of a chart dated 1775, gives the recognized harbor entrances and channels leading to the port at that early date. At that time what is now the city proper was all but an island connected with the mainland by a strip of land so low as to be awash at extreme high tides and so narrow that during the Revolution the British dug a moat or channel across it in front of their fortifications. The area of this island peninsula was 783 acres and the area of the peninsula, East Boston and Breed's Island, was 2,218 acres.

The growth of the city advanced in a unique way by land reclamation from the sea in the nature of filling great areas of low marsh lands, first inclosed with sea walls, at such times as necessity seemed to demand, and resulted in eventually changing almost the entire topography of the original island promontory, while further suburban aggrandizement was found in the annexation of adjoining towns. The total area thus reclaimed from the sea up to 1894 amounts to 2,245 acres, of which 1,018 acres are in the city proper. A striking feature of the latter section is the fact that the greater portion of all the railroad terminals, both freight and passenger, and all the present wharves, most of the great warehouses, and a large share of the wholesale business houses are on filled land, while by far the larger part of the present residential sections of the South End and Back Bay within the limits of the same section are the result of either raising or reclaiming land from tide water. The neighboring towns, Charlestown, East Boston, and South Boston, also increased their area materially in the same way.

But while this increase in the area of the city has been so rapid Mr. Humbert finds that harbor facilities have not been developed in the same ratio. To-day the city proper cannot expect any improvement in its wharfage except by a complete remodeling of the docks, which would not produce any considerable benefit, and the same he believes to be true of Charlestown and South Boston. But in East Boston the conditions are different, and here he says the Greater Boston must look for the development of port facilities for its increasing commerce. The territory is ample in acreage and the location is favorable, being contiguous to the three great channels of the inner harbor, thus giving room for the projection of a system of docks and wharves to be gradually developed on a plan in keeping with the port and its commerce. It is in East Boston that the great transatlantic lines have already built their permanent docks and warehouses, and the railway facilities in that section are already extensive.

Since the above paragraphs were written, a special committee of the Board of Aldermen has approved the suggestion, and has had plans drawn up for eight docks, six slips and two dry docks. The total amount of water frontage is over 20,000 feet, or nearly four miles; the water area of the slips is 2,204,000 square feet and that of the docks 3,406,000 square feet. The wharves vary from 400 to 150 feet in width, and the slips from 200 to 300 feet; they are all 1,200 feet long.—Engineering Record.

The Greater New York.

At a recent election the cities of New York and Brooklyn have voted for a consolidation of the two governments, which when carried into effect will greatly increase the population and landed area of the city of New York.

How to Make a Herbarium.

BY HELENA D. LEEMING.

To make what the early botanists called a hortus siccus, or dried garden, has become a fine art. There is but one recognized way for an American student to make a herbarium, and that is the method of preserving plants which is adopted by the colleges of this country, which is here set forth in detail. All scrap albums, sets of flowers mounted on cards, and floral groups must be relegated to the readers of souvenir books.

In selecting specimens to press, the whole plant, root and all, should be taken. If the plant is more than ten inches high, it should be bent over once or twice in a V or N shaped position. Specimens from a tall herbaceous plant should show a spray of flowers about 8-10 inches long, and a few of the leaves from the root. The fruit of a plant should always be collected and mounted on the same sheet. Seeds or pods that fall off can be kept in an envelope on the sheet.

For work in the field, a tin botany box is useful to keep specimens fresh; but a portfolio 12×17 inches, of wood, wire, or leather, and fastened with straps, is much to be preferred, as several hundred specimens can be brought home in it. It should be filled with folded sheets of unsized paper such as grocers use. These should be about 11×16 inches when folded. The fresh specimens should be laid just as they grow, without much attempt to straighten or arrange them, between the folded sheets, and crushed up in the portfolio. Plants that are wet with rain or dew are more apt to mildew or discolor than those collected in dry weather; but care will bring them out all right. Heavy, fleshy plants also need care, and may sometimes be split, as in the case of magnolias and thistles.

The materials for a press are two smooth boards, at least a hundred driers 11×16 inches, a quantity of single sheets of white grocer's paper of the same size, and a weight, of either a box of stones or five or ten bricks.

Very fair driers may be made of newspapers folded ten or twelve times to make thick pads, cut the uniform size, and basted together at the edges. But by far the best driers are the felt pads sold for the purpose. They are absorptive in the extreme, and make perfectly even, smooth specimens. Although they cost about $2 per hundred, they are the best investment that an amateur can make, for they last for years and insure perfect specimens.

When the plants are to be taken from the portfolio, which should be as soon as possible, and not over twelve hours after gathering, they are put in press as follows: Lay a board as a foundation; on it a drier; on that a sheet of white, bibulous grocer's paper; on that the specimens, which may now be straightened out and have some leaves turned over to show their under surfaces; on top of the specimens another sheet of white paper, then a drier, and so on, till all are in, when the remaining board is laid over all and the weights put on.

In twelve hours the wet driers should be replaced by dry ones, while the wet ones are put in the sunshine or wind or behind a stove. The driers should be changed again in another twelve hours, and afterward once a day for three or four days, when most of the plants will be dry. Some plants do not dry in less than a week, and some are so persistently moist that, in desperation, they have to be ironed.

The whole secret of making fine specimens lies in having good bibulous driers, and in frequent and regular changes.

The regulation size of mounting paper is 11½×16½ inches. It is a heavy white glazed paper, about the weight of a very heavy note paper. It is worth about $1 per hundred, cut, but may be obtained for less if a local paper company has the right weight in stock.

Various means are used to attach the specimens to the sheet. Ordinary glue is useful for woody stems and heavy specimens, but the neatest and most satisfactory way is to fasten each specimen down by putting several strips of gummed paper across it. These may be prepared by covering one side of a sheet of linen paper, architect's paper, or even ordinary strong white paper, with mucilage, and, when it is dry, cutting it into narrow strips.

The plants should not all be fastened in the middle of a sheet, or the pile will soon curve. They should be distributed with a certain regard for artistic effect, in various positions.

The scientific name of the plant, with its authority, as well as the name of the collector, the locality, and the date, should be written either in the right hand lower corner of the sheet, or on a 1½×3 inch label bearing the collector's name.

Either before or after the plants are mounted they should be poisoned to prevent insects from eating them, by spraying them with alcohol or benzine in which a little arsenic has been dissolved.

The genus covers for plants should be of a strong, heavy manila paper, cut so that when folded they are ¼ inch wider than the inclosed white sheets holding the species. In the lower left hand corner of these covers there should be written first the family name, and beneath it, close to the lower edge, the name of the genus—both in a strong, bold hand. In this cover all the species of one genus should be kept.

Of course all the genera of one family must be arranged together. In a small herbarium it is well to follow an alphabetic order.

No herbarium of over five hundred specimens can be managed easily unless kept in a case. Closet shelves and drawers will serve at first, but not long. A good and inexpensive kind is made like a light bookcase, six feet high, with a partition down the middle and thin stationary shelves five inches apart. Each compartment must be large enough to allow the cover sheets to slip in lengthwise. Glass doors are a great protection from dust, but few amateurs have them. —The Outlook.

Causes for Lameness.

How often our horses go lame soon after being shod by the best blacksmith, who thinks he is a scientific horse shoer, but knows nothing of the veterinary laws of conformation! He makes all conform to his iron rule or shoe with his knife and rasp. On this subject the Baltimore American says:

It is found that most maladies resulting from horse shoeing are due to an uneven and unbalanced wall (all that part of the hoof that is visible below the hair when the hoof is placed upon the ground) in connection with an undue height of the heel. If the heels are allowed to grow too high, the greater part of the weight is thrown forward upon the bone structure of the limb and the bones of the foot are forced forward against the wall in front.

Inflammation of the foot and soreness in the joints and bones soon follow such a course. If the toes, on the contrary, are allowed to grow too long, then the preponderance of weight is thrown upon the flexor tendons, which are on the back side of the foot, and these tendons become inflamed. The hoofs, therefore, must be pared in such a way that the weight of the animal is equally distributed between the bones and flexor tendons. If one heel is permitted to grow higher than the other, bruises on the high heel, called corns, will result. Horses with weak, tender, or bruised soles may for a time require leather or water-proof pads, but as the sole grows these should be discontinued. They are never required in healthy feet where the sole, which is the best and most natural protection, is allowed to grow undisturbed by the knife. Horses with corns should have their shoes made with a wide inside web, which rests upon the bars, or have for a time a bar shoe. The last nail on the inside should also be dispensed with, and the seat of the corn or bruise carefully pared out without injuring either the frog or the bars.

The Cold Storage Industry.

Money can be borrowed on butter, eggs, cheese, chickens and farm products of all kinds that will keep, as easily as on diamonds and watches. Not only is this so, but there is a great deal more money loaned on ordinary products than in all the pawn shops in New York. This is a business which is growing every year, and which has now assumed such an enormous proportion that it makes up a large part of the discount line of several banks.

Cold storage and the development of the storage warehouse business in New York have made this possible. Most of the warehouses, especially the storage warehouses, are to the banks what the pawnbroker's safe is to him, only the banks act through some one else, while the pawnbroker owns the warehouse and the capital both. Until recently it was not possible to keep long in good condition dairy products, eggs and many small fruits; they would spoil if not used within a few days after they were placed on the market. The cows and the chickens do not adjust themselves to the demand of the public, which requires in the winter an extra amount of butter and as many eggs as in the summer. As cold weather comes on, the efforts of the cows and chickens are largely directed to keeping themselves warm, with the result that their contributions to the public food supply are diminished.

In the summers before cold storage warehouses existed, the farmers had to send their milk, butter and eggs at once, so that they would be sold before they spoiled, with the result that the prices fell to such a low point that at times the shipments to the commission merchants did not realize enough to pay the freight.

Now the banks will accept storage certificates for collateral as readily as they would United States bonds, when the application for a loan comes to them through men whom they know. Every month the value of the collateral increases, and about the only possibility of loss is an earthquake or a fire, and the cold storage warehouse is regarded as an excellent insurance risk. The owners can protect themselves by insurance.

A man needs very little capital now to go into a butter, eggs and cheese speculation. He buys from the farmers and at once has the butter, eggs and chickens sent to the cold storage warehouse. He goes to the owner of the warehouse and gets a loan of 86 per cent of the value of his storage certificates on payment of the storage and the brokerage fee for getting the loan. He gives a note for the loan, which the warehouse men indorse and deposit with the storage certificates in their bank. With this money the buyer can go back and get more butter, eggs and chickens until he has enough stored to feed a country town for six months. The bank carries the loan on until winter.

Then when the rural supply of butter, eggs and chickens begins to diminish, and the market prices increase, the produce man gradually unloads his holdings, making sale from samples. As fast as he makes a sale he gives an order for the goods on the cold storage warehouse man, receives the money and takes up the storage certificates from the bank. When all the loans are taken up, the produce man owns absolutely the rest of the things he has stored, and he can do with them what he pleases.

Some produce men enlarge this speculation by making contracts with their customers by the year. They agree on a price from month to month, and at those prices they agree to furnish a fixed quantity. The market quotations may be higher or lower than the agreement. The produce man's profits come in the difference between the prices at which he buys in the summer, plus his warehouse bill and interest charges, and the price he gets.

It may be well for some one to point out to the farmers who are in the habit of railing at New York banks and capitalists that if no one would loan money on butter, eggs, chickens and small farm products, only so much of those could be carried as the individual capital of the produce men would permit, and prices in the summer would be much lower. The fact that the New York banks will loan money on these products prevents the low drops in price that used to come every summer at the expense of the farmer. It also lowers the price paid by the customers in the city during the winter, for all the farm products stored in the summer and fall have to be sold during the winter to prevent their running into the lower prices of the next summer.—New York Sun.

Planting Potatoes in the Fall.

There has been some discussion in the agricultural press about fall-planted potatoes, some averring that this method was not practicable, while others have found it to work to advantage. A friend who tried a small patch last fall explained to me his method, and is so pleased with the result that he will plant quite an acreage this fall.

In the latter part of October he planted a small piece in drills, cutting the tubers in generous pieces, and covering them some five or six inches deep with earth; over this he placed a mulch of straw six inches or more thick. No more attention was given them until the fore part of May, when the straw was raked off and the ground allowed to thaw. The potatoes made an early start, were kept clean of weeds by frequent cultivations, and, in spite of the severe drouth, matured a fine crop, mostly of large-sized tubers, which he harvested the second week in July. It is not generally considered necessary to cover the ground with a mulch as a protection in the spring, for that would prove a serious drawback when more than a very small acreage is planted; but the most serious objections to this method seem to be a liability of the seed rotting during the wet weather in early spring, unless they are planted on well drained or naturally drained ground, and a likelihood of the plant starting too early and being caught by late frosts. But in spite of these drawbacks the double advantage of having the crop in early, and doing it when there is more time than in the rush of spring work, would make fall planting popular if the farmers generally are assured that it can be done successfully.—L. E. K., in Country Gentleman.

Remedy for Leprosy.

Mr. E. H. Plumacher, United States consul at Maracaibo, Venezuela, sends us a detailed statement showing the apparently successful treatment of leprosy by means of a new remedy, the test having been made during a five months' trial, under carefully noted conditions, in the lazaretto at that place. The trials, however, have not been carried to the conclusion of complete cures, and the consul desires to interest others in the matter, that aid may be afforded for a continuance of the experiments. Those making this disease a specialty may find it of advantage to communicate with Consul Plumacher.

HAND cosmetic, for those who desire soft, white hands:

℞	Lanolin	20 parts.
	Glycerine	20 parts.
	Borate of soda	10 parts.
	Oil of eucalyptus	2 parts.
	Essence of bitter almonds	25 drops.

M. Sig.:—Rub hands with preparation and cover with gloves at night.—L'Odontologie.

The Disappearing Photograph.

A sheet of ordinary white, unsized printing paper, or blotting paper, is to be immersed in a liquid made by dissolving twenty grains of gelatine in an ounce of water. When the paper is thoroughly saturated, it is to be hung up to dry. After thorough drying, it is to be floated for three or four minutes on a mixture of one part saturated solution of bichromate of potash to two parts water, and again dried. The paper is now sensitive to light, and must be kept in a dark place. By exposure to the sun under a negative, for a sufficient time, a brownish print is produced, which is first to be soaked in cold water, until the unaltered bichromate of potash is dissolved out, and then in warm water, which removes all the gelatine that has not been rendered insoluble by the combined action of bichromate of potash and light. On the completion of this operation, the picture is still visible, in a faint brown color, but, by immersion in a solution of sulphurous acid, this color is bleached out, and, on drying, the paper appears perfectly white all over, without the faintest trace of an image. In order, however, to bring out the image, all that is necessary is to immerse the paper in what the British Journal calls "hydroxyl monohydride," in other words, clean water, whereupon the picture plainly appears, in white on a dark ground. On drying, it disappears again, and the process may be repeated as often as desired.

Java Tea and Coffee.

W. C. Knoofe, a rich coffee and sugar grower of Java, is among the recent arrivals at the California, says the San Francisco Examiner. He has lived in Java ten years and has large and flourishing plantations.

He told an interesting story recently about this queer country, for so many years under the control of the Dutch, and said that few persons understand the strange conditions of life there.

"You never saw such happy people anywhere as these little Javanese. They are always talking, laughing and dancing, and seem never to have any sort of care. They work in the tea, coffee and sugar plantations for 8 or 9 cents a day, and the best of them never get over 10 or 12 cents. Yet they are entirely contented. The women, who are the best for tea picking, do not get more than 4 or 5 cents a day. The tea is cut every forty days, so that there is always work to do. There is a big yield this year, and it is good tea, but it isn't worth much. We got word from Amsterdam, where much of our tea goes, that it was worth only from 9 to 10 cents a pound.

"With coffee and sugar the price is different. There never was as much money in sugar as at the present time. It is worth from $3.20 to $3.60 for each picul, or 134 pounds. The growers are getting rich. Both the coffee and sugar crops are very large, and like the tea, they are very fine. Coffee has veered around so much that there is no longer much money in it. All that is grown must be sold to the government. That is a requirement. It is cheap. In Holland it is worth but $6 for each 134 pounds.

"All the labor used is Javanese. It would not pay us to employ any other, and, though the wages are small, the people are probably the happiest on the globe. Their wants are few, the climate is so mild that little is worn, and they are as jolly as the day. There are 24,000,000 of them, and the Dutch government has never had the slightest trouble with any of them."

THE NEW CURE FOR DIPHTHERIA, CROUP, ETC.

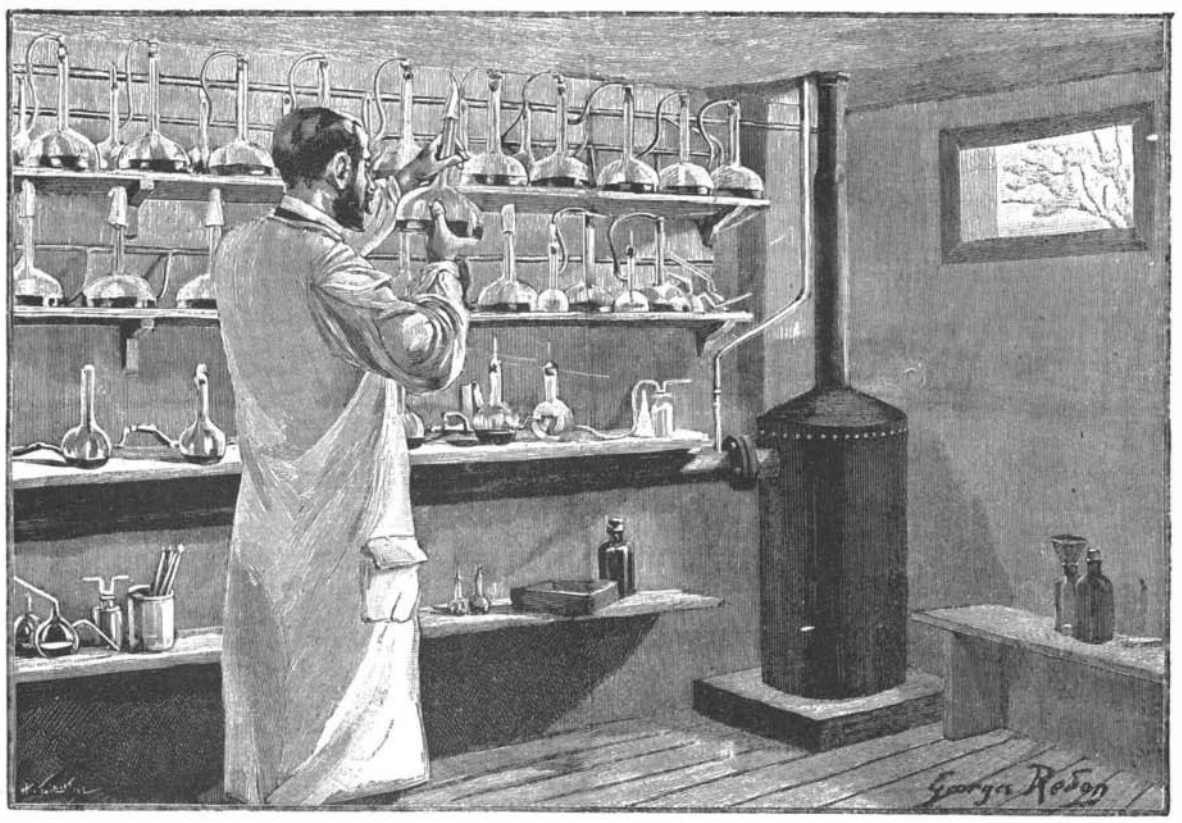
If the facts placed before the Hygienic Congress held at Budapest last month be not overstated, then the whole world owes a deep debt of gratitude to the young French savant, Dr. Roux, for the patient and heroic researches which have led to the discovery of an effectual cure for croup and diphtheria, and opened the way for further results not less startling. Such is the introductory announcement in the London Daily Graphic, which also gives the following:

THE NEW CURE FOR DIPHTHERIA, CROUP ETC.—INJECTING THE SERUM.

The distinguished Dr. Marsan points out how the new method was established. Diphtheria is produced by microbes which plant themselves in the membrane of the throat, and multiply; but unlike the bacilli of other infectious diseases, they remain obstinately in the same position, neither penetrating the system nor the blood. But if the deadly animalcules remain at the door, they are still able to secrete a poison of extreme violence, called "toxin," which quickly penetrates the circulation and infects the whole body. This toxin, thanks to the achievements of science, can now be isolated, and in the form of a fine powder will cause almost immediate death when injected into animals. However, it has been found that if a very small dose be introduced into certain animals, especially the horse, only a feeble reaction is produced. By repeating the operation, with gradually increasing doses, the organism of the animal finally revolts, and becomes not only impervious to the toxin, but destroys it, and from this singular result is due the origin of the new substance with which Dr. Roux wages war against diphtheria. In a word, it is the basis of a great revolution in the medical world, which henceforth will recognize in "Serum therapy" a heaven-sent system to root out most of the diseases connected with childhood. As Dr. Marsan well says, there are toxins and antitoxins for all microbic affections. Serum therapy will eventually discover a remedy for all infectious diseases. Yesterday it was tetanus in animals that it cured, to-day it is diphtheria, to-morrow it will be tuberculosis.

If you go to the Institut Pasteur, you will find comfortably stalled in the garden some ten or a dozen cab horses, in prime condition, aged from six to nine years, whose mission in life it is to furnish the precious fluid which every day snatches many a young life from an untimely grave. They are in their measure unconsciously solving the problem of how to stop the depopulation of France. They are well cared for, there is no cruelty in the process, no suffering entailed. The first process is to inject the deadly virus—the toxin—into the shoulder of the horse. This, of course, at first causes a slight indisposition, but after a while no ill effect is felt. The second step, as shown in one of the views, is to draw from the neck of the "prepared" animal a judicious quantity of blood. If the blood be allowed to stand for a while, the red corpuscles settle to the bottom, and the operator can then draw off the fluid, of a yellowish hue, resting above and containing the serum, or antitoxin. This, in its turn, is injected under the skin of the patient by means of a syringe analogous to that used for injecting morphine.

On February 1 of this year Dr. Roux began operations at the Hospital for Sick Children, Paris. He had a good supply of serum, and each day on making his visit to the hospital, he treated all the children he found there, in whatever state or condition of croup or diphtheria. There was no selection of subjects, a point to be borne in mind, nor was the ordinary treatment in any way modified or set aside. Things went on exactly as they had before, except that a new element had been introduced—namely the serum. During 1890, 1891, 1892, 1893, before Dr. Roux began his system, 3,971 children suffering from croup and diphtheria were admitted into the Hospital for Sick Children. Of these 2,029 died of the disease, the mortality thus being 52 per cent. On the other hand, from February 1 of this year up to July 24, the date up to which Dr. Roux furnished statistics to the Congress, the serum was applied to all without exception, and, out of 448 children, there were only 109 deaths—that is, the mortality had decreased to 24 per cent. As the conditions during these periods were the same, the difference between 52 per cent and 24 per cent indicates the indisputable benefit derived from Dr. Roux's treatment. If we take the same period at the Trousseau Hospital, Paris, where the old methods prevail, we find that out of 520 children admitted there, 316 died, thus giving a mortality during the months in question of 60 per cent.



THE NEW CURE FOR DIPHTHERIA—PREPARING THE TOXIN.

But this is not all. The serum, if applied, say, to a child suffering from quinsy, not only puts that ailment to flight, but renders the subject impervious to croup and diphtheria; and even measles and scarlatina are found to be of very rare occurrence, and then only of slight character, when the system has been fortified by