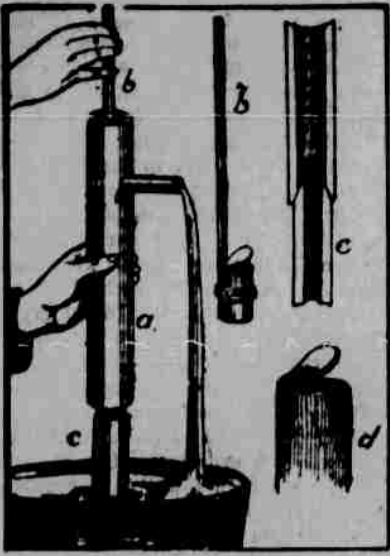


HOW A BOY CAN MAKE A PUMP.



Select a thick piece of bamboo about eight inches long and without joints; clean the inside carefully, making it as smooth as possible. Bore a small hole about two inches from one end to hold a smaller piece of bamboo, which is to form the spout. A hollow piece of bamboo (c) somewhat thinner than the pump barrel is inserted into the lower end of the pump barrel; the top of the barrel (c) is closed with a piece of rubber that is fastened with a small tack, and can be moved up and down. The pumping rod is made of a thin stick of wood and another short piece of bamboo (d). The short piece of bamboo (d) is closed on one end by a piece of rubber similar to the lower part of the pump mentioned before. This piece of bamboo is fastened to the stick of wood with the help of con' and putty, and must fit tightly into the pump barrel. The pump barrel will work satisfactorily if a small quantity of water is poured into the upper barrel to get it started.

BITTER ROT OF APPLES.

Damage to the Crop Estimated at \$10,000,000.

The Department of Agriculture has issued as bulletin No. 44 of the Bureau of Plant Industry a paper on the bitter rot of apples, prepared by Professor Hermann von Schreck, special agent in charge of the Mississippi Valley laboratory, and Perley Spaulding, a special agent of the department.

For the past four or five years the bitter rot of apples has been the cause of heavy losses to growers and handlers of this fruit. As stated in the department report for 1901, the president of the National Apple Shippers' Association estimated that the damage to the apple crop of the United States in 1900 from bitter rot was \$10,000,000. In some orchards there was a total loss of fruit; in others from one-half to two-thirds of the crop was destroyed.

The disease is especially severe in the Mississippi Valley and the States along the Ohio River. At the request of numerous growers the Bureau of Plant Industry undertook extensive investigations to determine more definitely the life history of the fungus causing bitter rot, with the hope of discovering a more effective method of holding it in check. The report of this investigation contains a general account of the history of the disease, a description and life history of the fungus causing it and some facts which have been recently discovered in regard to the mode of life of the parasite.

During the year 1901 co-operative experiments were carried on with the Illinois experiment station, but during the last season the work was conducted independently by both the station and the department. Co-operative experiments on the control of this disease were started the past year with the Missouri fruit experiment station, and will be continued with this station and fruit growers in various apple sections during the present season.—Washington Star.

IN HIS NATIVE TONGUE.

The Horse Understood Abuse When It Was Spoken in Portuguese. Ten or twelve years ago the present Prince of Wales visited Lisbon. He was then Prince George, "seeing the world" and having all sorts of experiences, delightful and absurd. At Lisbon a great review was held in his honor.

During the passage of the army Prince George's horse became unruly, and the crowd, edging nearer, made the situation an uncomfortable one. The prince spoke to his steed, at first gently and then fiercely, but without avail. Then he gave up, and exclaimed: "Oh, you poor brute! I suppose you don't understand English, and I can't talk to you in Portuguese."

The horse curviced again, and the prince was nearly unseated. Then he heard a voice within a yard of him say, in perfect English:

"Pardon me, your royal highness, but perhaps I can be of some assistance."

The prince looked around, and saw a youth in the black gown and shovel-hat of an English college. In his surprise he exclaimed:

"And who are you?"

"I am an Englishman, studying here at the English college, your royal highness, and I thought if you would allow me to abuse your horse in Portuguese, it might quiet him, and incidentally relieve your royal highness's feelings."

They tried the plan, and it worked admirably. The horse, hearing a language he knew, imbibed a few ideas from it, and concluded to profit by them.

Birth It s in Massachusetts. The birth rate among the foreign-born in Massachusetts is fifty-two per 1,000; among the native-born it is seventy.

A thrifty housewife can get eight meals out of one spring calico.



Science and Invention.

A new French life preserver is a belt filled with calcium carbide. It is quickly inflated by acetylene on being wet.

Great mountains on Venus are a supposed discovery of Herr Arendt, of Posen. These elevations appear to project through the clouds from time to time, and the observations thus far made tend to prove a rapid rotation in about twenty-four hours.

The magnetic pole in Northwestern America is supposed to have shifted considerably since its discovery by Ross in 1831. Taking with him seven companions in a small schooner, Amundsen, the Norwegian explorer, expects to make observations on the present site of this pole from 1893 to 1895.

Adding fine sulphur to the dissolved material, then heating, preferably with pressure, is found by Isidor Kltsee to more than double the resistance of cellulose as an insulator for electric wires. Flexibility varies with the percentage of sulphur, and resistance to acids and moisture is increased.

In the Smithsonian report on scientific work for 1902 Prof. Langley remarks that when the bolometer was invented, some twenty years ago, it was able to measure temperature to about one-one-hundred-thousandth of a degree. Since then the instrument and its adjuncts have been so far improved that temperature can now be measured to less than one-one-hundred-millionth of a degree readily and with precision.

The Italian government is awaking to the necessity of protecting what remains of its forests and to replanting devastated areas. The most valuable tree is the cork tree, which now abounds most in Sicily and Sardinia, the cork forests of Calabria having been almost wholly destroyed for charcoal. The present use of vast quantities of cork in the manufacture of linoleum and for shipbuilding emphasizes the importance of preserving and extending the cork forests. Spain also possesses great cork forests, and a few years ago the exportation of wine bottle corks from that country amounted in value to \$5,000,000.

The weights of 1,173 human brains have been collected by M. Marchand, of Marbourg. At birth the average weight is found to be 9.8 ounces in boys and 9.5 ounces in girls. At the age of one year, 2 pounds 1.5 ounces and 1 pound 11.5 ounces, respectively; and at the end of three years the weight has trebled. Increase is then slow. Full growth is attained at nineteen to twenty years in men and sixteen to eighteen in women, the mean adult weight being 3 pounds 1 ounce in males and 2 pounds 10 ounces in females. Loss by senile atrophy begins in man at about forty-eight years and in women at about seventy. Turgenoff, the Russian author, had one of the heaviest brains on record, weighing 4.7 pounds; and Gambetta's, scarcely 2.6 pounds, was one of the lightest.

The first "butterfly farm" is said to have been established only a year or two ago by the English entomologist, William Watkins, at Eastbourne, but already several similar farms have come into existence in France. The object is to rear rare genera of the Bombycidae, the silkworm family. They have, by crossing, obtained some new varieties, which are sought after by museums of natural history. They are also endeavoring to acclimate in France species of silkworms indigenous to other countries. The farms contain oaks, alnus trees, pines, plum trees, castor oil plants, and other plants the leaves of which serve as food for the caterpillars. Cocoons are hatched on branches protected by gauze, and, for the sake of uniform temperature, the insects are often kept in a room until after the first molting, when they are placed on bushes in the open air, and protected from birds by coverings of muslin or tulle.

GLIMPSES OF MARY LAMB.

With Some Notes About Her Famous Brother Charles.

Through the kindness of the Rev. G. S. Davies, of the Charterhouse, Godalming, says the London Bookman, we are able to print the following very interesting notes on Charles Lamb:

My mother was born in 1800 and died at 94, and must have been either the last, or last but one, of the friends of Charles Lamb. Lamb was a neighbor and a constant visitor at the house of her mother, Mrs. Hume, when she was a girl, and to the day of her death there was no name which ever seemed to bring such a light into her eyes. It was a household of girls, in which he seems to have been a delightful elder brother, and Mary Lamb often a fairy godmother. Miss Lamb so often applied for a half holiday for the girls on the ground that it was her birthday—"You know, Mrs. Hume, that to-day is my birthday"—that my grandmother had to say: "Oh, Mary, you seem to have a great many birthdays; but I believe the appeal was irresistible."

I have heard my mother say that when poor Mary Lamb used to feel the fit coming on her she would say: "Charles, you must take me away."

And they had seen the same and eight which some one else records of Charles Lamb taking his sister to safekeeping. My mother said that Lamb was terribly depressed at these times.

The male members of the family,

and I believe my father also, used sometimes to go for walks with Charles Lamb. On these occasions a strict control was kept on Charles Lamb's thirst. When he thought the distance was unduly great he would turn and say, "Don't you think I have walked a pint?"

My mother always told me that no likeness of Charles Lamb which she had ever seen at all brought back the man to her. She said that this was a great deal due to the total failure to catch the expression of his face. She said that Lamb had a very sweet and unforgettable smile which it would have been quite impossible to catch. I remember that when she was very old she made a pilgrimage to the portrait gallery, and came back much disappointed. She would not allow anything she had seen there or anywhere else gave her Charles Lamb as she knew him. She would have nothing to say to Hazlitt's picture of him.

She always told me that Lamb was as delightful and as full of irrepressible fun and humor, expressed in this same incomparable but quite natural style in his life as in his essays, but subject to deep fits of melancholy at intervals.

He was a man of very strong dislikes, and sincerely loathed anybody that he thought a mean-minded man, especially Goodwin, the publisher. She told me, but I dare say this is common property, that they found Lamb had made an entry in his diary, "Went to a funeral and made a joke." I believe it was Campbell's funeral.

New Rain Producer.

The latest Australian newspaper, contain particulars of some experiments, which are said to have been more or less successful, of a novel method of producing a downfall of rain, says the Philadelphia Ledger. The inventor makes this statement:

"I claim to produce rain by sending up continuously from three centers a column of gas made by certain chemicals. The gas, if sent up for a maximum of thirty-two hours, will produce rain over a range of ninety miles at any altitude, with any sky; and with the wind from any quarter, I do not need to wait until the wind is from the usually rainy quarter. In one experiment I made the barometric conditions were quite unfavorable, yet I produced rain. The gas, you see, causes in the different strata of the atmosphere a vacuum. This vacuum is the center of a heat storm and it filled by dense clouds that contain rain. These clouds come down with the gravity of the earth, when the rain descends.

"The rain is different from ordinary rain found in districts in which experiments have been made. It is tropical rain, coming from the very lofty regions, being slight at first, and then later descending in heavy showers and bucketfuls. My operations have been conducted in an inclosure twelve feet by eight. Though I cannot, of course, give away my secret, I may tell you that the chemicals have to be changed in accordance with the conditions."

Copy the Yankee Modes.

French swindlers, about whose methods a good deal has been written of late, are for the most part copies of American crooks. The trick of following a woman into a store, and just as she goes to make a purchase in assuming the role of an indignant husband, taking her money away from her and getting away before she has a chance to recover her surprise, was worked for some time in the West. It wasn't successful long here, because American women are harder-hearted than their French sisters, and, unlike the latter, do not assist the crooks by promptly going into hysterics or fainting when robbed.

A simple little swindle that was successful in this city for years was worked by a man and a boy. The boy would walk up the street swinging a pitcher around his head. The man standing on an opposite corner would call attention to the boy's recklessness and offer to bet \$5 or some larger amount that the boy would break the pitcher before he reached the corner. The crook rarely failed to hook a victim. Of course, just as the boy reached the corner he would break the pitcher and the crook would win the bet.—New York Sun.

More Than His Share.

Terence, a lusty, good-natured Irish man, was one of a number of workmen employed in erecting a new building. The owner of the building, who knew him, said to him one day:

"Terry, didn't you tell me once that a brother of yours is a bishop?"

"Yis, sor."

"And you are a hod-carrier! The good things of this life are not equally divided, are they, Terry?"

"No, sor," rejoined Terence, shouldering his hod and starting up the ladder with it. "Poor fella! He couldn't do this to save his life!"

Not as Crazy as He Seemed.

A Toledo real estate man paid \$50 for an old dock at Manhattan, O., a year ago and his friends said he was crazy. He has been selling the oak and walnut logs of which the dock was constructed and has thus far cleared \$20,000, with prospects of making a much more. The dock was sixty years old and the water curing has made the logs more valuable than they were when newly cut.

A Marvellous Menagerie.

The strangest menagerie in the world is on an Ohio farm. Through all the gardens, orchards and fields of this curious place one meets wild beasts of many kinds ingeniously fashioned out of roots, trunks, and the branches of trees. It is a veritable Noah's Ark grown up.



OPINIONS OF GREAT PAPERS ON IMPORTANT SUBJECTS

Flood and Fire.

NE part of our country drowns while another burns. Is it not strange that we do so little to prevent calamities which sweep away our properties and our lives? Until the need becomes extreme, it is difficult to procure laws for the general good when they conflict with the desires of many individuals. Much the same steps would reduce floods that would reduce droughts, and consequently fires. Forests are admittedly storehouses and distributors of dampness, yet we, whose country is so much the prey of fire and flood, have forestry laws far inferior to the forestry laws of many foreign countries. At the rate at which destruction now exceeds replacing, the whole supply of forests, it is calculated, will disappear in another generation. Whether the estimate is exaggerated or not, the fact that we destroy much and replace little is undoubted. There is pressing need for a more vigorous and liberal policy. This is the most permanent and important point to reiterate, in connection with our present misfortunes, although there are other improvements which ought to be well within our ingenuity and our enterprise. Reservoirs could apparently be arranged to receive the surplus waters in time of flood, with the additional advantage of releasing them in time of need. Much more stringent regulations along railway lines might diminish forest fires. The private individual whose abandoned cigar or bonfire starts a conflagration is beyond the reach of practical control. He will exist, and continue to make the world pay heavily for his existence, as long as the criminal and the tramp—one of which, indeed, he often is. We cannot expect individuals, lumber companies or railroads to give up their search for rapid wealth, or even their cherished indolence, out of pure benevolence. They will destroy forests for money, and sprinkle sparks from laziness, as long as such practices are permitted. The duty of those of us who are interested in the national welfare is to agitate until state and national legislation puts more checks upon the general recklessness. We can never be safe from wanton nature's freaks, but, when we put our minds and wills to it, we can decrease her outbreaks and make her work more smoothly in man's service.—Collier's Weekly.

Strenuous Life of the United States.

IT may be asked if American domestic habits have not something to do with the frequent breakdowns of American nerves. In perhaps the majority of cases, in cities at least, the day is admirably arranged so as to give the business man no rest whatever until he gets into bed. It has come within our observation that, in our civilization, there are three systems of living out the ordinary working day. There is the French system, which is that of the continent of Europe in general; there is the English system; and there is the American system. The last combines the chief features of the other two. The Englishman goes to work late and comes away early, but during working hours he works all the time. His luncheon is light, and eaten hastily—perhaps at his desk. For this he makes up by a leisurely breakfast and a leisurely dinner; while he has the early part of the morning and the latter part of the afternoon to himself. The Frenchman, on the other hand, goes to work early, and works hard till noon. The American is apt to underrate the energy with which the Frenchman works while he is working. But at noon work ceases, and he sits down to an abundant meal, well cooked, well served and eaten with appetite and in peace.

After his dejeuner he has his petit verre, his smoke, and perhaps a game of dominoes or cards, while he discusses politics, the arts, or the topics of the day. He takes his two hours of refreshment as a matter of course; he has no prickings of conscience at wasting time, nor searchings of heart lest some one else should "get ahead of him." Even the laborer, who in America eats his cold midday meal in a ditch or behind a pile of boards, generally sits down in Europe to a decent table, deftly served, and, however coarse his food, has time to eat otherwise than as the lower animals. Then, with mind cleared and cheered, and body strengthened and refreshed, laboring man and business man return to their tasks, to work hard and late. The American system, as we have said, combines the chief features of the other two. The American

goes to work early, like the Frenchman; like the French man, he works hard; like the Frenchman, he works late; but, like the Englishman, he takes no time to himself at midday. His luncheon is the merest "snack;" it is often cooked badly and served worse; it is oftener still, perhaps, drawn from a paper in his pocket, and not served at all. As for any intellectual repose or mental distraction from the grim facts of work—not only is it not thought of, but the very idea would be laughed to scorn. From the moment of setting forth to the moment of return mind and body alike are deprived of their proper nourishment and rest. It is scarcely strange, therefore, that Europe should be rich in elegant American widows and orphans, and the churchyards at home too full of young men's graves—Harper's Weekly.

This Example Dying Out.

ASSIUS MARCELLUS CLAY, typical man of the South, died recently at the age of 93. He was a great fighter, a great American in his way, there were many interesting events in his life.

The most interesting, undoubtedly, is the fact that although born a slave owner he was converted to the doctrines of the abolitionists by listening to a speech by William Lloyd Garrison. This conversion of the tall fighting Southerner by a speech of the mild friend of humanity is intensely interesting, since it proves how much sincere argument can do even with the most unpromising material. Cassius Marcellus Clay was converted to the idea that no man should be a slave. He was converted so thoroughly that he talked abolitionism through the South at the risk of his life, occasionally interrupting his speech to fight with a bowie knife those who failed to agree with him.

Another incident in the life of General Clay, according to the Louisville Courier-Journal, is preserved in an oil painting at the Metropolitan Art Museum in New York. The painting shows the Czar of Russia with his staff and the foreign Ambassadors at St. Petersburg. Cassius Marcellus Clay was the American Minister to Russia at that time. In the picture he and the Russian Czar are the only two men who have their hats on. On the occasion that the picture represents one of the other Ambassadors one of the other Ambassadors said to Clay that he ought to remove his hat in the presence of the Czar. To this the American Minister replied: "I take off my hat only to those who take off their hats to me."

He expressed here briefly what would seem to be a very good American doctrine. It is a good thing that we have outgrown Cassius Marcellus Clay's bowie knife and his way of using it to end an argument. But it is a misfortune that we have also outgrown his idea briefly expressed: "I take off my hat only to those who take off their hats to me."—Chicago American.

Wealth and the Man.

WEALTH is but relative. A million now is as but \$100,000 a hundred years ago. And then in this land was a group of landed aristocracy, an oligarchy of slave-owners, a class above the mass who, like Dr. Hillis' pampered sons and daughters of to-day, still sought the primrose path. Poor old human nature! It is much the same the world over day in, day out. God isn't trying the American people especially. Rather do we believe that the same natural laws work now as hitherto. If you eat too much your head aches. If you drink too much you suffer of various diseases and are likely to die as a whiff of smoke disappears in thin air. If you run the automobile against a tree you are likely to split your head. If you travel too fast a life you are likely to collide with eternal things. The early ripe and the early rotten are waste by-products of life. Man goes on digging, delving, doing things. Such a man of wealth as Peter Cooper Hewitt, who, instead of swelling around in a yacht loaded with champagne, puts his time into inventing such marvelous things as the mercury lamp, the electric interrupter and the electric converter, is a signal example that there are men and men, thank God!—Lewistown, (Me.) Journal.

RESULT OF SIMPLE HABITS

Of Great Men Contributed Greatly to Their Success in Life.

Benjamin Franklin, who is famed for his discovery that lightning is electricity, and who introduced the American colonial postal system, and who furthermore, as will be remembered, served America at the court of France as minister plenipotentiary, was one of the leaders of early modern times in the study of nature and nature's laws, and not the least in domestic science. His first maxim was: "Eat not to dullness; drink not to elevation." He reports the London Catering World. Even in his youth his mind was filled with schemes for self-regulation and guidance, and he set before him the task of acquiring the habits of certain cardinal virtues based upon simple living and habits of thought. His constant effort was to better the condition of mankind, and his methods were intensely practical.

The record of the life of Abraham Lincoln is traced back to that time when he was seen sitting on a rail fence in one of America's small Western villages, with a law book in one hand and with a piece of maize bread in the other. Abraham Lincoln was a man of simple habits, and his greatness was to no small extent dependent upon that early simplicity and goodness which gave strength to his conscience, mind and body.

Frederick the Great fostered above all agriculture and the cultivations of fruits and vegetables. His endeavor to benefit his people was based upon the natural laws pertaining to their health and simple happiness. He recognized the fact, ever since clear to the minds of the leaders of the Germans, that the body is the basis, and must be simple and completely nourished in order to perfect the soldier, statesman or the peasant.

Bismarck's great work had for its basis the recognition of the simple laws of nature. He followed them, and, as a result, there came about a new manhood and a new womanhood, first in Prussia, and later in the empire. Bismarck's natural and acquired astuteness taught him, as a similar perception and reasoning had taught

Priests Want Beards.

A petition has been sent to the archbishop of Vienna by the Catholic priests of Southern Austria for permission to wear beards. One of the reasons given for desiring this indulgence is that they are often mistaken for strolling actors with their shaven faces, and another is that many of them are suffering from "preachers' sore throat," which they think flowing beards will cure.

The priests do not say which of the two evils annoy more, but they seem to lay more stress upon the fact that they are mistaken for actors. Catholic clergymen wear beards more often than is generally supposed. Some of the monastic orders are bearded, and whenever there is any good reason for a priest letting his beard grow that privilege is extended to him. In fact, the wearing of beards seems to be on the increase among the Catholic priesthood, while with the Episcopalian priesthood the contrary is the case.

A Change of Heart.

The operator in a telegraph office has many chances for the observation of varying phases of human nature if he chooses to make the best of them.

A young woman stepped to the desk, and asked in a trembling voice for telegraph blanks. She wrote upon one, tore it in halves, wrote a second, which she treated in the same way, and at last a third. This last she handed to the operator with a feverish request that he would "hurry it."

This he did, and after she had gone he read the other two for his own amusement.

The first was, "All is over. I never wish to see you again."

The second read, "Do not write or try to see me at present."

The third was, "Come at once. Can you take next train? Please answer."

Highest Look in the World.

The lock to be placed in the Danube-Oder Canal will be 131 feet high, and the highest in the world. The Austrian minister of commerce has offered prizes of 100,000, 75,000 and 50,000 crowns for the best plans for it.

Anxious to Please.

"Now see here," said the man who called himself "particular," and whom the outside world called "fussy," to the restaurant waiter, "I want you to pay attention, and serve things exactly as I say, or I sha'n't eat them, and what's more, I sha'n't pay for them."

"Yes, sir," said the waiter, head bent forward, face devoid of any sort of expression.

"I want toast, well toasted, but not burned, buttered while it's hot, set in the oven for one minute, then served."

"Yes, sir. Well done, not burned, buttered hot, set in oven one minute, serve."

"And coffee, strong, clear, hot, but not scalding."

"Yes, sir. Black, hot, no scald."

"And steak—sirlon, thick but not too thick, well done but not overdone."

"Yes, sir. Medium sirlon, medium broil."

"And two eggs, new-laid eggs, fried on one side only."

"Yes, sir. Two, fresh fried, on—on which side, sir?"

It is a pretty thing, when a mother dies, to speak of the vacant chair, but you can bet if there are any men in the family, it isn't the rocker.