

WONDERS OF SCIENCE.

The Loss of Heat Sustained by Burning Wet Coal.

Some people suppose that they add to the heat-giving power of coal by wetting it. Others maintain that wetting injures it as a heating agent. The latter seem to have the facts of science on their side, contrary to the opinion entertained by many steam users and boiler attendants, there is not only no economy in using wet coal in boiler furnaces, but, on the contrary a considerable loss. The water with which the coal is moistened must be evaporated, and the heat required to do this is abstracted from that furnished by the combustion of the coal, and which would otherwise be utilized in evaporating water in the boiler. The evaporated water which was mingled with the coal is simply discharged from the chimney as steam along with the other furnace gases, and the heat which it has absorbed in its passage out of the furnace represents just so many wasted heat units, which should have been imparted to the boiler shell, and from this to the water within it. The idea that the decomposition of the water into its constituent elements, and the subsequent combustion of these produces a largely increased heating effect, which is the argument advanced by those who believe in the economy of using wet fuel, is founded on totally erroneous premises, and indicates, on the part of those who advance it, a want of accurate knowledge of the principles underlying the phenomena of combustion, and of the conservation of energy. The evaporation of the water mingled with the coal requires that a certain amount of heat shall be imparted to it. This heat, as above stated, must be furnished by the burning coal. To decompose this water into its constituent elements—oxygen and hydrogen—requires that it shall be heated very high—that is to say, until it reaches a temperature at which the affinity of the atoms of hydrogen and oxygen for each other is overcome by the superior affinity of the carbon for the oxygen. The large increment of heat required for this dissociation of the water molecules must also be abstracted from that of the burning fuel. A certain quantity of it, it is true, is given back to the furnace again by the combustion of the carbon with the oxygen of the dissociated water, but only a portion; and by the combustion of the liberated hydrogen, the balance of the heat abstracted would be restored. It is apparent, therefore, that the most that could be effected, would be the restoration to the combustion chamber of a quantity of heat equal to that which was abstracted from it, less the quantity required to evaporate the water, which is practically all wasted. But this is on the supposition that all the water gas formed by the interaction of the water vapor with the glowing carbon is perfectly burned to carbonic acid and water, which can never be realized in practice, since the gases escaping from the chimney invariably contain, besides unconsumed carbon, also carbonic oxide, and probably also free hydrogen, showing that combustion is incomplete. The use of wet fuel, with the idea of realizing an economy thereby, is, therefore, a fallacy, which must prove a costly one to those who practice it. Under certain circumstances—as, for example, burning refuse products, such as spent tan, logwood chips, sawdust or slack coal, where the finely comminuted condition of the fuel, and its tendency to pack and choke the grate, renders it necessary to employ an artificial draft, the dampening of the fuel may be found serviceable in preventing the carrying off of a quantity of the finer portion of the fuel unconsumed, since it will give these a chance to bake together or coke in adhering masses; or, in lieu of this, the injection of an additional air supply along the sides of the fire chamber above the fuel, or at the bridge wall, by means of small jets of steam, which has the advantage of facilitating the thorough admixture of air with the great volumes of partially consumed combustion products in the fire chamber, may be found advantageous. In both of these suppositions, however, the advantages derived from the use of water or of steam, are indirect and mechanical, and in no wise justify the assumption that the use of water, directly or indirectly, adds anything to the heat of the combustion or carbonaceous fuels.

He Thought It Very Funny.

Bill Nye tells the Boston Globe that "while out trout fishing on the Kinnick, Wis., the other day, an old farmer at whose house I stooped got me to read my own stuff in the Weekly Globe. While he sat and chuckled through it. Then, of course, without knowing who I was, but supposing I was a town dude out for relaxation, he asked me if I didn't think that was a d—n sight the best thing I ever read. I told him there was no doubt about it whatever."

The Candid Man.

It is a curious fact that the wild animal known as the candid man is never able to see your good qualities, but he snaps at your bad ones like a hungry trout at a fly. He looks you all over with his critical microscope, and if there is something good in your life does he take it gently in his hands, hold it up to the sunshine, turn it round to get a better view, and put it back in its place with the remark, "That's worth having and I'm glad you have it; try and get some more of the same kind!" Never. We say it very emphatically, Never! He is not candid in that way. But let him catch a glimpse of a fib and he will chase it as a weasel does a rat, and when he has caught it he will hold it up with an air of triumph, as though he had no other business in life than to hunt for such things, and then deliver a forty-minute discourse on the ultimate destination of people who tell fibs, and end by saying with an air of deprecation, "I'm candid, and always say what I think."

SWALLOWING DEATH.

A List of the Diseases That Lurk in the Barrel and Bottle.

It is a common saying among moderate drinkers that "one glass of beer now and then never did a man any harm," and a "good stiff glass of toddy going to bed makes one sleep like a top and wake like a lark. We give the opinions of two eminent physicians upon the effects of alcohol, taken, not in excess as by confirmed drunkards, but in moderation:—Dr. Trotter enumerates twenty-eight diseases arising from intoxicating drinks, viz: "Apoplexy, epilepsy, hysteric, convulsions, fearful dreams, gastritis, enteritis, ophthalmia, carbuncle, hepatitis, gout, schirrous of the bowels, fatal obstruction of the lacteals, jaundice, indigestion, dropsy, tabes, syncope, diabetes, lock-jaw, palsy, ulcers, madness, idiocy, melancholy, impotency, premature old age and diseases of infants during suckling."

Dr. Carpenter thus enumerates the diseases induced by alcoholic excesses:—

- 1. Diseases of the Nervous System.—Delirium embriusum, drunken madness, delirium tremens, insanity, oinomania, mental debility in offspring, inflammatory diseases of the brain, apoplexy, paralysis, epilepsy, criminal conduct, including suicidal mania, homicidal mania, pyromania—an uncontrollable desire to commit acts of incendiarism—kleptomania—an uncontrollable desire to steal—and erotomania.
2. Diseases of the Alimentary Canal.—Irritation and inflammation of the mucous membrane of the stomach, inflammatory gastric dyspepsia, disorders of intestinal mucous membrane.
3. Diseases of the Liver.—Congestion, acute and chronic inflammation, atrophy—wasting, hypertrophy—enlargement, hob nailed liver.
4. Diseases of the Kidneys.—Albuminuria, or Bright's Disease.
5. Diseases of the Skin.—Carbuncle, boils, erysipelas, acne, psora, ebriusum—drunkard's itch.
6. General Disorders of Nutrition.—Tendency to the deposition of fat, diminished power of sustaining injuries, liability to epidemic diseases, gout and rheumatism, diseases of heart and arteries.

Here, then, we have a catalogue of the most terrible diseases that can afflict mankind, all of them induced by the use of alcoholic liquors, and some of them never occurring except in those who drink.

Two colored barbers, one an old man and the other a young one. The young one took off his apron and started out of the door.

"Yo's swan to git a drink, Jim?" asked the elder.

"Dat's what I's gwon to do!"

"Go and git yo' drink. I yoost ter do de same ting when I wuz young. When I was first married dah was a gin-mill next do' de shop wha' I wucked, and I spent in it fifty and sebetny-five cents a day outen de dollah 'a half I eahned. Wall, one mawnin I went into de butchah shop, and who shoed cum in but de man wat kep' de likkershop.

"Gib me ten or twelve pounds po'terhouse steak," said he.

"He got it and went out. I sneaked up to de butchah.

"Gib me ten cents' wuf of libber," was my remark.

"It wuz all I cood pay fur. Now yoo go and git yo' drink. You'll eat libber, but de man wat sells yo' de stuff will hev his potterhouse steak. De man behin' de bah eats po'terhouse—de man in front eats libber. I ain't touched de stuff fo' thirty yeahs, and I'm eatin' po'terhouse myself."—Rehoboth Herald.

Mark Twain at a Fire.

Rev. J. Hyatt Smith knows more stories about more people than ten average citizens. Among them he relates this:—"When I was living with my brother in Buffalo, Mark Twain occupied a cottage across the street. We did not see very much of him, but one morning as we enjoyed our cigars on the verandah after breakfast, we saw Mark come to his door in his dressing gown and slippers and looked over at us. He stood at his door and smoked for a minute, as if making up his mind about something, and last opened his gate and came lounging across the street. There was an unoccupied rocking chair on the verandah, and when my brother offered it to him he dropped into it with a sigh of relief. He smoked for a moment and said:

"Nice morning."
"Yes, very pleasant."
"Shouldn't wonder if we had rain by and bye."

"Well, we could stand a little."
"This is a nice house you have here?"

"Yes; we rather like it."
"How's your family?"
"Quite well—and yours?"
"O, we're all comfortable."

There was another impressive silence, and finally Mark Twain crossed his legs, blew a puff of smoke into the air, and in his lazy drawl, remarked: "I suppose you're a little surprised to see me over here so early. Fact is, I haven't been so neighborly, perhaps, as I ought to be. We must mend that state of things. But this morning I came over because I thought you might be interested in knowing that your roof is on fire. It struck me that it would be a good idea if—"

But at the mention of the fire the whole family dusted up stairs, trailing language all the way up. When we had put the fire out and had returned to the verandah Mark wasn't there.—Kansas City Times.

James Gardner went to bathe in the Monongahela river, near the Try street bridge, Pittsburg, last week with some of his friends, and, being under the influence of liquor, was drowned.

WANDERING WHIMSICALITIES.

The Colum for Thiu People to Read.

"What is it that keep you busy writing so late in your study every night?" asked Mrs. Yerger of her husband.

"I am writing the history of my life."
"I suppose you mention me in it."
"Oh, yes; I call you the sunshine of my existence."

"Do I really throw so much sunshine into your daily life?"
"I refer to you as the sunshine of my existence because you make it hot for me."

A rise in the thermometer occurred immediately after the foregoing conversation.—TEXAS SETTINGS.

"JOHN," asked a doctor of the apothecary's boy, "did Mrs. Green get the medicine I ordered?" "I guess so," replied John, "for I saw crape on the door knob this morning."

The Irish "bull" is an article that is often very spurious. Anyone who makes a bad joke is apt to palm it off on "an Irishman." But the following are vouched for by an English paper as having been committed at a recent Dublin meeting:—"Speaking on the much vexed Irish question, the speaker said—"The country is overrun by absentee landlords," after a magnificent peroration, deliriously from the tub on which he was standing, he said, "I tell you the cup of old Ireland's misery is overflowing; aye, and it's not full yet."

"Yes, brethren," says the clergyman who is preaching the funeral sermon, "our deceased brother was cut down in a single hour—torn from the arms of his loving wife, who is thus left a desolate widow at the early age of twentyfour years," "Twenty-two, if you please," sobs the widow in the front pew, emerging from her handkerchief in an instant.—CHRISTIAN AT WORK.

The Wrong Man.

First Gentleman—I beg your pardon, sir, but is not your name Smythe?"
Second Gentleman—No, sir; my name is Smith. You have evidently mistaken me for my son."

Such a Boy Deserves Quarantining.

A gentleman of this city has a small boy, when a friend called recently the father said to him politely, "I wish I had another cigar to offer you," looking with regret at the one he was smoking. Now was the small boy's opportunity. "I know where they are, pa," he said, dragging open a drawer and bringing out a box of choice brand.—

A Happy Father.

Said an exasperated Texas father at the dinner table:—"You children turn up your noses at everything on the table. When I was a boy I was glad to get enough dry bread to eat."

"I say, Pa, you are having a much better time of it, now you are living with us, ain't you?" remarked little Tommy.—

Stings and Arrows.

It was really a delightful morning, and Imogene had just dropped in to see a friend on the line of her morning walk.

"Why, I am so delighted to see you," was the cordial welcome; "and you have your new brocade mantle?"

"Yes, Cicely, dear. I thought I might as well. You haven't yours yet, I believe?"

"No, indeed. I read they are going out of style as rapidly as autumn leaves?"

"Then I should think you would have one. You know you always buy on a falling market."

The Difference.

In Sigourney, Ia., when the cemetery needs cleaning up, the people turn out in a body on an appointed day and do the job up in style. In Chicago, when the cemetery needs cleaning up, the lot owners pay \$5 each, and the superintendent puts the money in his pocket and orders another spear of grass for his own lot.

A Chat About Ice Cream.

New York Times:—He: They give very large dishes of cream here. She: Yes. He: One dish is about all that one dare eat. She: Yes. He: Particularly as ice cream is said to be far from healthy. She: Yes. He: I understand that much of the ice cream nowadays is made up of poisonous compounds. She: Yes. Here, waiter, give me another dish of vanilla, and bring me the check for it.

Mons. Capel on American Originality.

Mons. Capel is a singularly observant man, and he seems to cover everything as he goes along. We were speaking of his tour and he touched upon the lack of originality in houses and house furnishing in America.

"I have visited," he said, "several houses in Philadelphia, for instance. I have found in each house the same way in rooms that look exactly alike. They are all made wholesale by machinery and turned out to exact patterns. You cannot tell one house from another."

Woolsey's Wit.

Few men have been blessed with a more appreciative wit than Prof. Woolsey. A Harvard man, well known in the pulpit of to-day, asked the professor once in company from what quarter he had obtained his honorary degree. "I got my L. L. D. from Middletown, where they know no law," was the answer that took with it a twinkle of the eye, and I got my D.D.—the twinkle brightens maliciously "I got my D.D. from Harvard, where they know no divinity."

Mr. Giraud, M. P., addressed another meeting at St. Laurent yesterday, when a petition was unanimously adopted praying the Government to take the necessary steps to test the legality of Riel's trial and his mental condition.

ABOUT HEADS.

Lord Bacon says in one of his apothegms, "that wise nature did never put her precious jewels into a garret four stories high, and that exceeding tall men had ever very empty heads." This saying has often been used by way of a joke at the expense of tall people, especially of those with genius and reputation.

The same idea is thus quaintly put by witty old Fuller: "Often the cockloft is empty in those whom nature hath built many stories high."

Bacon's notion may be true, though we doubt if facts support it. But there is another common saying which facts contradict.

I assert that men of great intellectual powers have large and massive heads. Goldsmith brings out this vulgar opinion in the familiar lines about the village schoolmaster.

Amazed the gaping rustics ranged around; And still they gazed and still the wonder grew, That one small head could carry all he knew.

A writer in the Journal of Science says the idea that a great intellect requires a large head is not supported by facts.

An examination of busts, pictures, medallions, etc., of the world's famous celebrities almost tend the other way. In the earlier paintings, it is true, men are distinguished by their large heads, but this is attributable to the painters, who agreed with the general opinion, and wished to flatter their sitters.

A receding forehead is mostly condemned. Nevertheless this feature is found in Alexander the Great and to a lesser degree, in Julius Caesar. The head of Frederick the Great, as will be seen in one of the portraits in Carlyle's work, recedes.

Other great men have had positively small heads. Lord Byron's was remarkably small.

Men of genius of ancient times have only what may be called an ordinary or every-day forehead, and Herodotus, Alcibiades, Plato, Aristotle and Epicurus, among others, are mentioned as instances.

Some are even low-browed, as Burton, the author of the "Anatomy of Melancholy," and Albert Durer.

The average forehead of the Greek sculptures in the frieze from the Parthenon is, we are told, "lower, if anything, than what is seen in many modern foreheads."

The gods themselves are represented with "ordinary, if not low brows." Thus it appears that the popular notion on the matter is erroneous, and that there may be great men with little heads.

A Duel in the Year 1875.

THE CHALLENGE.

SIR—The last time I had the honor of being in your company you undesignedly and unknowingly affronted me, without making any apology, by treading on my toes, or, indeed, to speak more properly, only upon my shoe, which at that time happened to be rather too long for me, so that I had not "luckily" observed this circumstance of it as well as yourself.

All men of honor and spirit would regard me as a monster unfit for society should I compromise the affair or be satisfied with any other expiation for this offence than your blood. In vain do they plead religion and reason against a practice so civilized as duelling. No man who entertains just notions of this laudable custom but ought to scorn to listen to either when urged in opposition to it. Therefore, Sir, repair to-morrow morning by five o'clock to Hyde park corner, properly furnished with arms and attended by your second, where you will meet me divested of everything human and prepared either to cut your throat or blow out your brains, of which two methods of departure I very civilly give you your choice. I remain, notwithstanding, with great sincerity, sir, your "real" friend and humble servant,

THE ANSWER.

SIR—I received your challenge, and being desirous to render society an acceptable service by ridding it of a useless member, which will be the case whoever of us falls, I shall not fail to appear at the time and place appointed, accompanied by my doughty friend and square, who has but a moderate stomach for fighting and is there fore equally disposed either to peace or war. In the meantime, making the necessary dispositions for the day of battle, I remain, with a measure of your sincerity, sir, your "obliged" friend and very humble servant.

We put a drop of alcohol into a man's eye. It poisons it. We try it upon the lining of a living stomach. Again it poisons it. We study after death the stomachs of drinking men and find alcohol produces in regular stages redness, intense congestion, morbid secretions, deeper hurt, destruction of parts, utter ruin. We study its influence upon the health and strength of sailors and soldiers and find it helps to freeze them in the Arctic regions and exhausts them in the tropics. We watch two regiments on a long march in India, one with and the other without grog, and are driven to the conclusion that even moderate quantities of alcohol weaken the muscles and break the endurance. We visit the training grounds of oarsmen, pedestrians, and prize fighters, and learn everywhere the same lesson—alcohol is a poison to muscle and brain.—Dio Lewis.

Provincial Exhibition.

The Tenth Provincial Exhibition

will be held under the auspices of the Board of Agriculture

—AT— ST. BONIFACE, MALITOBA

—ON— September 28, 29 and 30 And October 1, 2 and 3.

\$10,000 IN MONEY PRIZES, Besides Medals, Diplomas, &c.

Closed stalls provided for Horses and comfortable sheds for other animals.

Passengers will be carried by Railway at a Single Fare for the double journey. Exhibits at a single rate.

See posters and advertisements for particulars of special trains, &c.

Formal Opening by the Lieutenant-Governor, Sept. 30th.

Entries close September 15th. Entry fee \$1.00.

ADMISSION TO GROUNDS, 25c. For Prize Lists, Entry Papers, and other particulars address ACTON BURROWS, Secretary-Treasurer Board of Agriculture, ag29-oc2 Winnipeg.

PERRY DAVIS' PAIN KILLER

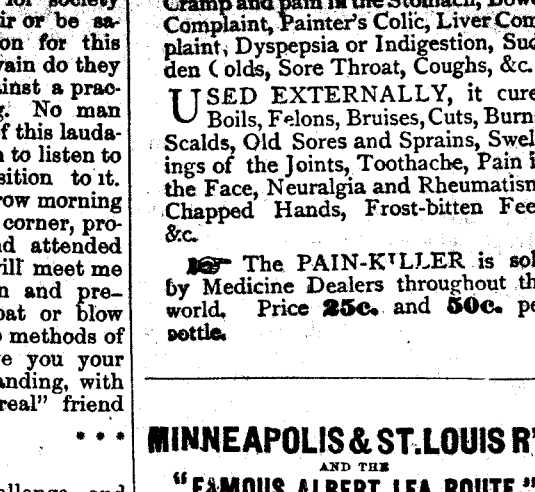
TAKEN INTERNALLY it cures Dysentery, Cholera, Diarrhoea, Cramp and pain in the Stomach, Bowel Complaint, Painter's Colic, Liver Complaint, Dyspepsia or Indigestion, Sudden Colds, Sore Throat, Coughs, &c.

USED EXTERNALLY, it cures Boils, Felons, Bruises, Cuts, Burns, Scalds, Old Sores and Sprains, Swellings of the Joints, Toothache, Pain in the Face, Neuralgia and Rheumatism, Chapped Hands, Frost-bitten Feet, &c.

The PAIN-KILLER is sold by Medicine Dealers throughout the world. Price 25c. and 50c. per bottle.

MINNEAPOLIS & ST. LOUIS RY

AND THE "FAMOUS ALBERT LEA ROUTE."



The above is a correct map of the ALBERT LEA ROUTE, and its immediate connections. Through Trains daily from ST. PAUL AND MINNEAPOLIS TO CHICAGO, without change, connecting with lines EAST AND SOUTH-EAST.

The only line running Through Cars between MINNEAPOLIS and DEL. JOHNS, Iowa. Through Trains between MINNEAPOLIS AND ST. LOUIS, connecting in Union Depot for 12 points South and Southwest. Close connections with St. P., L. & M. N. P., and St. P. & Duluth R. roads, from and to all points North and North-West.

REMEMBER! PULLMAN CARS on all night Trains. Ticket, and baggage checked to destination. For time tables, rates of fare, etc., call upon nearest Ticket Agent, or address S. F. AYD, Gen'l Tkt. & Pass. Agt., Minneapolis.

Gold Watch Free.

The publishers of the Capital City Home Guest, the well-known Illustrated Literary and Family Magazine, make the following liberal offer for the New Year: The person telling us if it does not more than one correct answer, the second will receive a Gold Lady's Hunting Case Swiss Watch, worth \$50; a key-winding English Watch, worth \$25; or a fine time-piece, worth \$10. Each person must send 25 cts. with their answer, for which they will receive three months' subscription to the Home Guest, a \$0 page Illustrated New Year Book, a Case of 25 articles that the ladies will appreciate, and report containing names of winners. Address: PUBL. OF HOME GUEST, HARTFORD, CONN.