Mysteries of Nature

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WORLD'S COAL BEDS GOING FAST.

Coal is the chief corner stone of modern civilization. Nearly all the labor-saving appliances must have coal to make them effective. Outside of the muscles of men and animals the chief sources of power available for the use of man are gravitation as it is set free in falling water and heat arising from the chemical combustion of coal. But waterfalls are stationary, and even with the ability to distribute their power through electricity, it is available as yet over only a limited area. If all the power of Niagara should be turned into electricity it could not profitably be distributed beyond the limits of western New York, whereas coal can be carried to the ends of the earth and its power set free for use wherever it is needed. If the prairies of the west and the comparatively level regions the world over, where are found the best agricultural lands, were limited, as formerly, to water power for running their factories and mills, these would necessarily be few and insignificant. Such great manufacturing centers as Cleveland, Detroit, Chicago, St. Louis and Cincinnati would be impossible away from the mountainous districts. It would be a tremendous setback to the agricultural interests of the Mississippi valley if they were compelled to dispense with steam thrashers and steam traction engines and substitute in their places the work of innumerable droves of horses and mules.

It is therefore rather startling to be compelled to face the fact that coal belongs to the limited and rapidly disappearing reserved stores of nature. In using coal the human race is intrenching upon its capital, and recklessly hastening an ultimate but inevitable catastrophe. It is estimated by the highest authorities that the total available coal treasures of North America cover 220,000 square miles, with an average thickness of six feet of workable seams, which would yield 4,800 tons to the acre. The total amount of coal, therefore, that is possibly within our reach in America could not exceed 700,000,000,000 tons. But in the year 1900 alone we were mining but little short of 300,000,000 tons, while the expansion of population and increase of business is demanding an increase at such a rate that two or three times that amount will soon be necessary to meet the annual demand. At the present rate of increase in the use of coal, therefore, the entire amount accessible in North America would be consumed in less than 150 years.

If we look to the rest of the world the prospect is not more encouraging. The coal fields of Europe are mostly confined to small areas in England and the northwestern part of the continent. Spain, Italy, Greece, Russia Scandinavia, and the larger part of the German Empire are dependent on England for their coal. At the present rate of increased production these fields will be nearly exhausted in 50 years. The remaining great deposits of coal are mostly found in China, where they equal, if they do not exceed, those in the United States. It may therefore be fortunate for the world that China is so slow in her development that her reserved sources of fuel shall yet be available when that in the countries more advanced in civilization shall fail.

The insignificant role which water power in this country can possibly play in keeping up our industries appears on brief examination of the facts. It is estimated by the best authorities that if the entire rainfall over the state of Pennsylvania were utilized with a head of 150 feet, it would not yield one-tenth the amount of power that is now derived in that state alone from the consumption of coal. But on the most extravagant calculation it would not be possible to make available in that mountainous state one-tenth of this theoretical amount of water power. What then would be the condition of those vast areas of the Mississippi valley where water power is far less available?

But, for the moment, leaving aside these rather sobering reflections to the far-seeing statesman and philosopher, we will turn to the consideration of those interesting processes by which even the existing limited amount of this useful material has been brought within our reach and preserved for our use.

Coal is an accumulation of vegetable matter which has decayed under water where oxygen could not get access to the carbon to consume it and transform it into carbonic acid gas, as it does in the open air. The conditions of the coal fields, therefore, during the accumulation of the coal must have been that of vast swampy regions, where there was not depth of water enough to destroy the vegetation or to admit of the intrusion of gravel, sand and mud, which, brought in from surrounding highlands, would have rendered it too impure for use. The character of the vegetation which supplied these great accumulations of coal is amply shown in the fossil forms which appear, especially near the top and bottom of the coal seams, while in some cases the entire stumps of trees are found still standing in place, with their roots penetrating into the under clay which supported the vegetation.

In Nova Scotia there are found no less than 76 seams of coal separated by beds of sandstone and shale. Each of these beds indicates a change of level which took place in the region during its accumulation. During the accumulation of the coal the swamp was so shallow that no currents of water would carry into it sand and gravel to interfere with the growth or bury it. But after a certain amount of vegetable deposits had accumulated, there was a subsidence of the area, allowing access to currents of water carrying sediment sufficient to bury the deposit of coal, and furnish the basis for the growth of vegetation in another swamp on top of the accumulated sediment, and so the process went on indefinitely, as long as the climate continued favorable, and these changes of level continued to proceed with the appropriate rate of rapidity.

The fossil plants of the coal period seem to indicate that the climate was at that time warm and moist and uniform, while the amount of coal accumulated shows that the air was much more fully charged with carbonic acid gas than it is at the present time. Of the coal plants of Great Britain about half were ferns, many of them growing to the size of trees, the most of which are tropical species. Indeed, during the coal period in Great Britain the proportion of ferns there to the other plants was far greater than it is in the tropics at the present day, while tree ferns are now wholly confined to tropical regions. Abundant tropical forms of vegetation are found in the coal seams in Greenland and on Melville island as far north as the seventy-fifth degree of latitude; indeed, everywhere during the coal period the climatic conditions not only of the temperate zone, but of the arctic lands, were closely similar to those of the present torrid zone.

But, for man's use, it was necessary not only to have coal accumulate; it must be preserved for distant ages and brought within his reach. If the Mississippi basin had remained forever below the ocean level, its stores of accumulated coal would have been unavailable. But, through causes which we can but dimly comprehend, at the close of the coal period the land all over that area, which had up to that time been slowly sinking, reversed its movement and began to rise. The elevation was produced by lateral pressure, which folded up the Allegheny mountains and produced a number of diminutive waves, so to speak, in the surface of the land extending to the center of the Mississippi basin.

But no sooner was this land elevated above the sea than erosive agencies went to work to dissect it and to remove its more elevated portions. Consequently it is estimated that more than nine-tenths of the coal which was originally deposited over central and eastern Pennsylvania, has been carried away by the rivers, and hopelessly scattered over the bottom of the sea, while the one-tenth which remains is so folded up in the rocks that it is obtained with great difficulty. In the more central portions of the Mississippi valley, however, the disturbance of the strata has been less, and it is a comparatively simple matter to obtain the rich deposits.

MAINTAIN AIR OF STOLIDITY.

Anything Like Jollity or Sparkling Conversation Frowned on by British Diners.

A dinner is in progress at a first-class hotel. Elegant toilets, splendid surroundings—and an absence of sound. Slowly, stiffly, like automatons, the dining ladies and gentlemen proceed with their meal. The scene is undoubtedly very impressive, but oh, so sad! Amid the sparkle of jewels and silver and crystal and porcelain, amid a scene that fairly invites, begs, cries for a bright smile, a low, rippling laugh, or at least that deep, animated hum that makes itself otherwise noticed wherever there is a large gathering, the diners sit as in expectation of the judgment day. Sometimes somebody does speak. One word or two. The lips hardly part. The other nods his head in terrible earnest. Then silence reigns supreme again, according to a German writing in the London Mail.

A friend who had been in England once related a story the point of which I have never fully appreciated until now. Like myself, the first time he had entered a dining-room in London he looked around in surprise. Finally toward the end of the meal he called the waiter. "Tell me, please," he asked; "does anybody ever laugh here?"

"Well," replied the waiter, "I am sorry to say that we have had complaints before. But not often, sir—not often."

London Schools.

According to the report for 1907-08 of the London county council education committee, there were in the schools 882,834 elementary scholars—a decrease on the year of 7,759. The cost of building schools has decreased from £19 12s 9d in 1901 to £12 17s 6d a scholar in 1907-08. To insure attendance 4,250,000 visits were made by school attendance officers during the year. The number of summonses decreased from 20,584 in 1902-03 to 13,687 in 1907-08.

EVENING GOWNS

These sketches show two of the best models for evening gowns for the summer. The one on the right is after a Paris design. The one on the left is of meteor crepe in apricot color. The trimming is made of bands of dull gold on white net.

MANY USES OF TISSUE PAPER

Especially Is It Valuable When Packing a Trunk—How It May Be Applied.

We cannot overestimate the value of tissue paper if we are of the traveling public. While it is delightfully careful and neat to own a vast array of shoe bags, one to the pair, and bags and slipcovers galore for parasols, hair brushes and each thing we want to separate from every other, the fact remains that they take up a far too generous proportion of our trunk space. Tissue paper, which is a very good substitute, takes up none of the valuable room and is in no way open to criticism. It is clean, white and dainty; quantities of it are available at any time, and there is no better material for filling sleeves and tucked or puffed gowns to keep them from crushing. Tissue paper should be crumpled and poked into ribbon or lace hat bows and among hat flowers, and should surround the hat itself to keep it from flattening against the sides of the box or trunk lid.

Each pair of dainty gloves and all neckwear should be separately wrapped. Layers of it to separate the varied contents of the trunk will make the terrible business of unpacking less difficult.

Travelers who have packed with tissue paper have been quite won over to its use.

IN SAILOR STYLE.

This dress, made in the ever-favorite sailor style, would look well in cream serge. The skirt is entirely plaited, and is stitched at the foot. The novelty lies in the blouse, which is cut in two pieces, and arranged in a wrapped seam. A box-plait is made down the center of front, which fastens up to the neck; the pocket sewn at the left side will be found most useful. White silk embroidered collars and cuffs edged with frills are worn and give a pretty effect.

Hat of coarse straw, trimmed with a puffed net crown and roses.

Materials required: 4 yards serge, 46 inches wide.

Ribbon Hair Band.

A rather wide band of ribbon brought up round the hair and tied in a broad girlish bow at one side is a French head finish much favored.

Sleeveless Gauze Coats.

Sleeveless coats of gauze or net give a dressy touch to a costume. They are designed primarily for wear indoors.

MAKES A NOVEL NECK PIECE

New Ruch Designed to Be Worn with Soft Summer Silk Is Easily Made.

A rather new little ruch to be worn with soft summer silk or other one-piece frocks is made of liberty satin, or chiffon, with long ends that look almost like a sash.

The material is fastened around a boned collar lining, fastened at the back, and is laid either in flat plaits or is tucked in clusters of thread tucks.

To conceal the opening which comes a little to the left rather than in the middle of the back, is a small rosette of the material, from which hang two long ends that come well below the waist.

Sometimes these ends are finished in a long pendant ornament of jet or silk the color of the stock. Again they have silk fringe, and occasionally they are hemstitched across the end in several rows.

With a gray silk frock a charming stock of this order could be made of tucked net a tone darker than the dress. Each tuck could be run with a line of silver thread. The fluffy rosette could have a flat button in the center darned with the silver thread, and the ends can be accordion-plaited with a deep silver tinsel fringe. If preferred, tiny silver bugles can be sewed to the bottom of the streamers.

Any clever-fingered girl can make herself one of these fashionable new stocks—and use her wits to give old touches and charming color effects.

Upside Down.

Women, indeed, are clever, but the one who saw a hat-brim decoration in her unbecoming lace veil was more than ordinarily farseeing.

Now, the ornate and bordered veil has vied with the real lace fichu a hundred times for a place on the summer hat, but it has not done duty as a face veil and a hat trimming until this unusually resourceful woman turned the straight edge down and then spread the bordered part over the brim of her large leghorn hat. This brought delicately scattered sprays and dots over her face in a more becoming scantiness and gave place on the hat for the full display of the handsome pattern on the border.

Panieres and Crinoline.

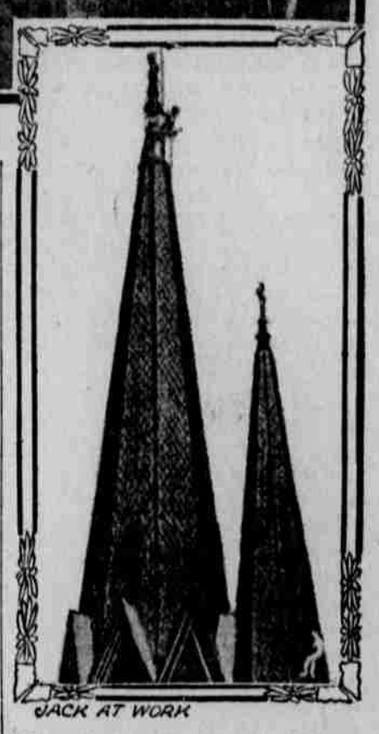
Silks, satins and brocades are at once suggested by the newest models and not the soft, clinging fabrics so wonderfully adapted to the graceful close fitting designs. Materials that can stand alone, the old-time standard of excellence, will once again be in demand, and unless there is a more concerted plan of action among all women where taste in dress stands for authority, there is really grave danger of paniers and even crinoline being seriously considered. This has been threatened time and again, but has always at the last moment failed to materialize; so it is to be hoped this time again the fashion will be killed before it becomes established.

Princess Hip Yoke.

The cuirass or princess hip yoke effect which has been conspicious in imported gowns since the first openings of the season is being brought out in many unexpected ways. One of the newest is the entire princess gown with the lower part of the bodice and the hip portion of the skirt covered with embroidery, which makes them one in line and treatment. In this way it is possible to turn a two-piece gown into a princess, the simple process of covering the waist seam with embroidery or braid being all that is needed. Some of the trimmings of this kind are put on in jacket or coat shape.

PERILS OF A STEEPLEJACK

GILDING CROSSES



JACK AT WORK

An object of unusual interest to residents and visitors in Troy, a "steeple Jack" has for several weeks past been swinging daily about the steeples of St. Joseph's Provincial seminary, the famous "Towers of Troy," as they have come to be called, occupied, with as much nonchalance as though on terra firma, in the task of making extensive repairs to those steeples and placing an eight-foot gilded cross on each of the four spires. The "Towers of Troy," from their elevated position on the crest of the hill overlooking the center of the city, form a landmark easily recognized for many miles in all directions, and like stalwart sentinels they have stood guard over the busy commercial section of the city below these 30 years or more.

Weakened by age, a high wind several months ago carried away the pinnacle of one of the spires and drew attention to a general weakening of the others, so the Sisters of St. Joseph, who hold the seminary property, recently awarded a contract for strengthening the steeples and placing a large gilded cross upon each. George Ferguson of Albany, a famous "steeple Jack," was selected for the hazardous undertaking, and for the last six weeks he has been engaged with two assistants in performing the work.

A few minutes of observation of the painstaking, methodical movements of the "steeple Jack" is sufficient to convince the observer that his is no easy task. Beside being a sort of mechanical engineer, the "steeple Jack," to be a success, must be a master of several trades. To observe a man seated in his boatswain's chair anchored against the side of a spire may give the impression that the work is easy, but imagine standing in a loop of rope and sawing off a section of tower above one's head weighing nearly half a ton. Yet that was what was done on these towers. The old finial ornaments, placed at the top of the spires when the building was erected back in the '70's as a Methodist university, were each 14 feet high and nearly four feet in diameter, and in their decayed condition considerable skill was required to prevent them falling the wrong way and causing damage to the building.

Mr. Ferguson declares that the only part of the work which may be called easy is the actual climbing. This is accomplished in a novel manner, for the steeples, rising 75 or more feet in the air, present nothing upon which a hold may be secured, and yet he climbs without scaffolding. Patiently — it may seem tediously—the steeple is climbed by means of two ropes securely wound around the tower, leaving a loop to slip over the body. Alternating from the lower to the upper loop, similar to hitching up a pole, the "steeple Jack" gradually works up to the very top, carrying tackle and swing-chair, from which he proceeds to repair or paint as required.

Mr. Ferguson inherited his profession of steeple-climbing from his father, who followed that business for more than 32 years, climbing the highest spires throughout the eastern states and finally meeting his end by a fall of 30 feet at the Albany penitentiary building in 1891. A decayed wall, capped by stone, gave way while he was painting it, and he was killed instantly. The son was serving at the time as an apprentice in the navy, a calling which presents some similar situations, and when he received his discharge in 1892 he succeeded to his father's business. Of modest but jovial disposition, he credits the fact that he has had no accidents to his athletic build and temperate habits, for, as he strongly declares, drinking intoxicants and steeple-climbing "do not mix."

The illustration gives an idea of the size of the crosses being gilded before placed.

RURAL AUCTIONEER DREADED CHARACTER

Last Act of Tragedy Is Where He Plays the Leadiug Part—Novel Sights on the Day of the Sale as Old Farm Is Delivered Into the Hands of Strangers.

The most conspicuous character in the last act of the humble tragedy of the abandoned farm is very often the rural auctioneer, says Collier's. He it is who rings the curtain down with careless quip and boisterous jest. Perhaps his burly presence has been menacing the household through long years of gripping struggle with adversity. The land has been becoming poorer, the ambitious men of the family have gone away to seek their fortunes elsewhere, and on the heels of misfortune has followed the chattel mortgage. Unsung heroism, incredible economies, toil unceasing, have not sufficed to check the steady decadence of the farm and its affairs. Some day, when the ultimate disaster can no longer be held at arm's length, a printed bill, announcing the sale at auction of stock, tools, and household, is posted in the village store and the postoffice.

The idlers scan the bill with curious interest, but with no marked symptoms of surprise. The auction has been a foregone conclusion for some time. The storekeeper remarks to his leisurely customers:

"Old Jonathan Woodman has been livin' alone on the farm for years and years. He's the last of 'em. All petered out, ain't they? He's going to live with his grand-daughter in Newmarket, so they tell me. Hung on longer than I expected, the old man did. Too old to do much farming and no money to hire help."

On the morning of the sale the roads leading toward the Woodman place are populous with vehicles more serviceable than elegant—concords, democrats, buggies, carry-alls and rattling wagons. An auction is a diversion, a mild excitement, and the women folk forsake their spicy kitchens to enjoy a day's outing, with the bulging dinner basket tucked under the front seat. Long before the auctioneer is ready to begin his task the Woodman house, dooryard and barn are overrun by a curious, shrewdly calculating crowd discussing the family history and the values of its goods and chattels.

The Day They Celebrate.

Ojibways of the Mississippi band have regularly each year since 1868 celebrated their acceptance of the White Earth reservation in western Minnesota.

Within the limits of its boundaries in northern Minnesota these people have come out of barbarism into an advanced stage of civilization. From being American wards and helpless children they are now citizens and owners of the land, with deeds duly signed with their own signatures proving their claims.

Even to this year the days of June 15 and 16 are celebrated instead of July 4, though it is possible that hereafter the Americans' Independence day will be accepted as their own time of rejoicing.—Fur News.

Alarmed.

Suddenly there was a great commotion in space and Mars was observed to be whirling away from the earth at top speed.

"What's the trouble?" queried the astronomers on the earth. "Afraid we want to steal your canals?"

"No," signaled the Martians, "we just heard that that man Castro was about to pay us a visit."