

with numerous impressions, not unlike the scales of a ganoid fish, and from this peculiarity the name is derived.

Another carboniferous plant allied to the foregoing, was the *Sigillariid*, the trunk of which bore numerous impressions suggesting seal imprints, and these were arranged in vertical rows. The trunk was often deeply fluted. Pieces of the bark (Fig. 11) often occur in coal seams, exhibiting the characteristic markings to perfection. [Dr. Talmage related an interesting experience of his at Wilkesbarre, Pa., at the time of the disastrous cave-in of a portion of the town, a few years ago. The collapse was caused through the extensive mining operations which had been carried on beneath the city, till the earth had become completely honey-combed. The surface sank, and daylight fell on the deep recesses of the mine, usually seen only by artificial light. The professor collected there, he said, a number of his choicest fossils. Ed.]



Fig. 11.

The *sigillariids* frequently occur in mines, standing in a vertical position. They are sometimes cut through in the course of mining operations; and then, their tapering form may permit them to descend into the the passages with disastrous consequences. These trunks are called by the miners, "coal-pipes," and are greatly dreaded. Some *sigillariid* fossils found in Pennsylvania are five feet in width; and from eighty to a hundred feet in length.

The *Calamites* (Fig. 12) formed another strange feature of the carboniferous forests. These plants belonged to the order of *equisetae* or horse-tails, the representatives of which class to-day seldom exceed in length two feet; and in thickness that of the finger, but the *calamites* were more than two feet in diameter at the base, and from twenty-five to thirty feet high. The view shows the *calamite* as restored by Dawson. The stem was jointed, and the leaves were attached in whorls.

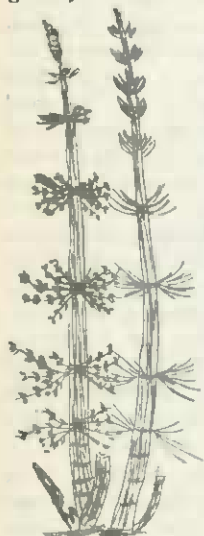


Fig. 12.

The view upon the screen shows

many other forms of plant growth. There is the *asterophyllite*, somewhat resembling the *calamite*; together with monster club mosses, gigantic tree ferns; and a wide variety of conifers.

How did these forests become buried so as to bring about the needed metamorphosis? By the agency of storms and convulsions which perhaps far exceeded the severest of such phenomena to-day. Man in his brief life does not witness the operations of all of the engines of his Maker's power. On the canvas, the artist has sought to express his ideas of such a prehistoric storm. Terrible indeed is the representation here given us, but his brush has moved without a copy. The painter had no model, his labor, though deep and beautiful may be far from correct.

Here (Fig. 13) is a view offering a strange contrast in its blackness to the bright hued paintings just exhibited. It is a truthful picture though, and to the thoughtful listener, perhaps of deeper interest than the grandest of ideals.



Fig. 13.

This is a photograph of a piece of coal upon which there appears the impression of a fern leaf. Wonderful, is it not—that such a frail, delicate structure could be preserved in all of its details through so great a lapse of time? And for what was it thus preserved, if not to tell the story of it by-gone life? Is it not eloquent in its stony silence? None can doubt the fact of its former existence, or its miraculous preservation. Such remains are often so well defined that the very order and class to which the original belonged can with certainty be determined.

Well has the poetess, Mary Branch, written, while contemplating this wonder:—

In a valley, centuries ago,
Grew a little fern leaf, green and slender,
Veining delicate and fibres tender,
Waving when the wind crept down so low:
Rushes tall, and moss, and grass grew round it,
Playful sunbeams darted in and found it,
Drops of dew stole down by night and crowned it.

But no foot of man e'er came that way—
Earth was young and keeping holiday.

Monster fishes swam the silent main,
Stately forests waved their giant branches,
Mountains hurled their snowy avalanches,
Mammoth creatures stalked across the plain;
Nature revelled in grand mysteries;
But the little fern was not of these,
Did not number with the hills and trees,

Only grew and waved its sweet wild way;
No one came to note it day by day.

Earth, one time, put on a frolic mood,
Heaved the rocks and changed the mighty motion

Of the deep, strong currents of the ocean;
Moved the plain and shook the haughty wood,

Crushed the little fern in soft, moist clay,
Covered it and hid it safe away.

Oh, the long, long centuries since that day!
Oh, the changes! Oh, life's bitter cost!
Since the useless little fern was lost.

Useless? Lost? There came a thoughtful man,

Searching nature's secrets far and deep;
From a fissure in a rocky steep

He withdrew a stone o'er which there ran

Fairy pencillings, a quaint design,

Leafage, veining, fibres, clear and fine,

And the fern's life lay in every line!

So, I think, God hides some souls away,

Sweetly to surprise us at the Last Day!

In the later Paleozoic and the earlier Mesozoic ages, *Ammonites* appeared in great numbers. The picture (Fig. 14) represents a fine specimen. These

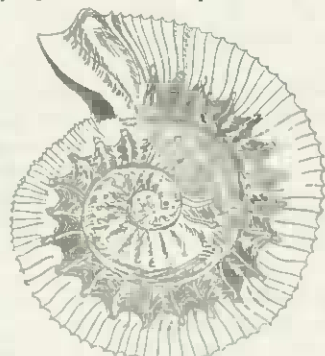


Fig. 14.

were molluscs, or soft-bodied creatures, protected by a hard shell. The name is applied through the resemblance of the shell to a coiled ram's horn, such as was once used to adorn the entrance to the temple of Jupiter Ammon. The shell is beautifully ribbed and marked without, and the fossil is among the most beautiful of molluscs. Interiorly, the shell was chambered, the outer ribs marking the septa. These dividing walls formed supports for the outer parts of the shell. A tube—the siphuncle—threaded all the chambers. The animal inhabited but the last or largest segment—the other chambers which formed its residence during the earlier stages of its growth, served as water chambers, by filling or emptying which, through the action of the siphuncle, the creature could rise or sink in the water at pleasure—very unlike the almost motionless marine molluscs of these times. As the animal grew, finding its shell too small, it built another more commodious home; and, leaving the former dwelling, lived only in the last. The beau-