

Correspondence.

Fast Trains.

To the Editor of the Scientific American:

By some oversight, your article in last issue on "Speed of Passenger Trains" makes no reference to the three fastest trains which are scheduled in the *Travelers' Official Guide*. The Pennsylvania and Philadelphia & Reading railroads each have a train which leaves Philadelphia at 7:30 A. M. and arrives at New York exactly two hours later. Including ferries and stops, this shows an average speed exceeding 45 miles per hour for each train. The Pennsylvania R.R. train makes one stop *en route* to Jersey City, and the Reading train four stops (including one for change of engines), and as the distance traveled by each is within a fraction of 90 miles, it would show that the Reading train is the faster. Omitting the 7 minutes consumed in crossing the one mile of ferry, it makes an average speed of 47.4 miles per hour, including stops. While traveling on this train, I have timed a mile in 48 seconds (a rate of 75 miles per hour), and either train will usually run several miles at the rate of 67 miles per hour or better every trip. The Baltimore & Ohio R.R. has a train scheduled for the comparatively short run between Baltimore and Washington at the rate of 53 miles per hour.

G. H. S.

Franklin, Pa., September 11, 1888.

Hemlock Lumber and Bark.

To the Editor of the Scientific American:

In your issue of the 15th inst. you publish an article on "Hemlock Lumber and Bark," written by Jackson S. Schultz, and copied from the *Shoe and Leather Reporter*, which contains much that is true and interesting, yet some things which are erroneous and misleading. What he says of the use of hemlock timber is, in the main, true; and he might have added that it is superior to pine and spruce for frames where other work must be fastened to it with nails, as it is well known that it will hold nails equal to any other known, so called, soft wood. In addition, it is equally as fine grained and suitable for interior oil finish as the popular Georgia pine.

But he errs when he says its use for railroad ties is prevented mainly because it does not hold spikes as well as oak and chestnut. It will hold a spike as well as chestnut, and a hemlock is as good as a chestnut tie as long as it is sound. The trouble is it will not last when exposed. Five years is about as long as you can depend on hemlock when used for ties, trestles, or other exposed structures, while the average life of oak and chestnut in like situations is about ten years. Mr. Schultz must be misinformed of the length of time—eighteen years—that hemlock ties have lasted in the railroad named. I do not believe a hemlock tie, without artificial preparation, ever did fairly safe service for eight years when placed in the roadbed of an American railroad.

Mr. Schultz is far from the facts when he states that "the counties of Elk, McKeon, Sullivan, Warren, and Forest are substantially intact." Of course he is not supposed to be personally acquainted with the actual state of affairs. Not all the forests are hemlock. There are large tracts known as beech, maple, or chestnut ridges, where scarcely a hemlock tree can be found. In addition, the lumberman's ax, followed, as it almost invariably is, by fire, has ruined thousands and thousands of acres.

The immense tanning establishments in Sullivan, Lycoming, Tioga—in which is located the largest one in the world, owned by Hoyt Brothers—Potter, McKeon, Elk, Forest, Cameron, and Warren, show what is being done to the hemlock forests of northern Pennsylvania. Mr. Schultz certainly cannot mean that the present supply can be kept up for any great length of time. It must not be expected when such destruction is going on. Already bark is being hauled eight or ten miles by teams to supply the various establishments.

The prices named by him—\$5 and \$6 per cord or ton of 2,200 pounds—do not, as a rule, prevail. The insane desire of the lumberman to cut down every tree he can reach has had its legitimate effect, and the average price is from \$4 to \$5 instead. Probably more is purchased at \$4.50 and under than otherwise. Let twenty years roll by, and we shall see a much altered state of affairs. Considerable hemlock timberland has been purchased by the heavy operators, but those who shall not own their own bark will, in the near future, pay all that Mr. Schultz names, and more too.

The child Mr. Schultz mentions will not necessarily have to reach fourscore years of age to see a greatly lessened supply of hemlock bark; and before he shall be one-half that age he will have seen the decay and abandonment of a large portion of the existing establishments without a corresponding increase of new ones.

S. B. ELLIOTT.

Du Bois, Pa., Sept. 18, 1888.

FRESH meat beginning to sour will sweeten if placed out of doors in the air over night.

The Panama Rocks.

BY H. C. HOVEY.

The Devonian rocks of Pennsylvania and western New York are topped by five distinct conglomerate formations. The oldest of the five is in the Upper Chemung group, and its southernmost exposure is in a charming little valley, through which meanders the Brokenstraw Creek, a tributary of the Alleghany River. From its location near the village of Panama, in Chautauqua County, N. Y., it is called the Panama conglomerate, and its typical ridge is known as the Panama Rocks, and has for many years attracted the attention of the inhabitants of the region. Professor Starr called my own attention to it during a recent outing at Lake Chautauqua, and with a party of explorers we visited the place. The owner is Mr. G. W. Hubbard, who has expended a considerable sum in opening the grounds, without in any respect impairing their natural wildness, so that all parts are readily accessible to visitors, of whom, as he informed me, there have been more than 10,000 this year, coming from nearly every State in the Union, as well as from other lands.

On examining the ridge, we found that it is underlain by a bed of arenaceous shale, that has been much eroded by the water soaking through the conglomerate. As the shale gave way, the superincumbent conglomerate broke by natural jointage into square masses, which were left to slip apart, leaving spaces between the huge blocks. The general appearance may be imagined from the local term of "Rock City," which is certainly very appropriate. We were told that there were a number of such rock cities in the region, and that some of those in Cattaraugus County and in Alleghany County were quite as remarkable as the Panama Rocks.

The impression left with almost every visitor is that these rocks have been thrown to the surface by some subterranean force. And yet, any one who has ever visited the canons of Colorado or Ausable Chasm, N. Y., or the caverns of Kentucky, can testify that rocks of equal magnitude may be tossed about in an extraordinary manner by simple erosion and undermining. The Brokenstraw Valley, a mile wide, has doubtless known a mightier flood than the little mill stream that now winds through its channel. This is proved by the conglomerate itself, which is a peculiar mass of tiny white quartz pebbles, each pebble being a true oval, and all of them, as they repose in the strata, being pointed in the same direction. These were, of course, parts of larger fragments detached from primitive ledges, and subjected to long continued attrition and polishing by flowing water, until, in time, heavy beds of uniformly fine gravel were formed overlying beds of sandy mud. They were then cemented together by a calcareous deposit, and were finally broken into blocks by the washing out of the shale underneath. These blocks present perpendicular faces varying from twenty to sixty feet in height, and about the same in breadth.

The fissures between them reach from top to bottom, generally giving room for a narrow pathway. In several instances the summits were in contact while the bases were spread apart, thus forming caverns of considerable size. One of these is called "The Counterfeiters' Den," because actually resorted to as a hiding place by certain manufacturers of spurious bills and coins, who are now serving their time in prison for their misdeeds. Various fanciful names have been given to other grottoes. The "Ice Cave" is a cleft in whose deep recesses the snow is drifted in winter in such quantities as to remain through the summer, not melting till autumn. Inquiry satisfied me that this phenomenon has nothing in common with those mysterious freezing wells and ice grottoes whose waters freeze in summer and thaw in winter. Indeed, the conditions are totally unlike, and the ice cave of Panama may be set down as merely a natural ice house, and, as such, a remarkable curiosity.

By a descent called "The Natural Stairs," a fissure is reached that may be entered from the summit, followed for a long distance between rocks forty feet high, and under a rocky roof until the winding tunnel opens at the foot of the rocks. Those who persist in regarding the whole ridge as the result of upheaval rather than subsidence called my attention to the fact that the stratified conglomerate, after running in a uniform direction for a considerable distance through this fissure, suddenly changes to an obtuse angle. But this tilting might have been due to the disturbance caused by the erosion of the underlying shale, which could hardly have gone on at an equal rate everywhere.

There is abundant evidence of the powerful action of huge volumes of water at some former period. The surfaces of the conglomerate masses are frequently polished, so as to make it necessary for one to be somewhat careful in walking over them, lest a slip should be followed by a fall. The corners are nicely rounded, as if by running water; and to the same cause may be ascribed the numerous round pockets worn in the face of the rocks.

"Cradle Rock" rests on a ledge a little below the top of one of the many precipices, weighs several tons, and yet is so delicately balanced that the weight of a person stepping upon it will cause it to rock to and fro, as if

about to topple over into the chasm below. Yet the danger is imaginary, and probably nothing less than a charge of dynamite would dislodge the stone from the shelf on which it rests.

Although the surrounding region is under cultivation, the original forest has never been removed from the Panama Rocks, and the grand old trees so completely hide this remarkable formation that one might ride through the valley below without suspecting what a romantic region was thus concealed. Indeed, it is not easy to explain such a luxuriant growth of forest trees where there is so little soil to support plant life. I noticed particularly a large pine growing on the summit of an isolated mass of rock, the surface of which was nearly bare, while the perpendicular sides were fully forty feet high. Large birches cling to the sides, whose enormous roots rival the trunks in size, and run down in fantastic spirals to reach the rich soil covering the floor of the various fissures. On one large rocky fragment we noticed two great trees, one at each end of the rock, whose spreading roots had completely enveloped it, some of them being at least thirty feet long. These are but specimens of the hundreds of trees that grow here in a manner almost aerial, and wholly unlike anything I should look for among the sober, steady old trees of this temperate zone.

In conclusion let me suggest the propriety of having this extraordinary region, which after all covers only a few acres, secured as a State park. Its present owner (as has been already stated) takes pride in keeping it in its primitive condition, except as it has been necessary to do a little clearing in order to make its intricate passages accessible. But the place is sought by speculators to whom it might not be safe to trust such a peculiar treasure of nature. The time has come for the State to get possession of all such places, which are not only attractive as resorts for tourists, but are also richly instructive in both botanical and geological science.

The End of the Great Eastern.

Although there are still some persons who believe—and perhaps the wish is father to the thought—that this great vessel, designed by Brunel, will not come to such an inglorious end, there is very little doubt that she will be broken up, and her fragments sold as old iron. After having passed through so many vicissitudes for the thirty years of her existence, the Great Eastern was successfully beached near New Ferry, on the Cheshire shore of the Mersey, on August 25. The previous Wednesday at noon she was got under way, and started from the Clyde on her last voyage. With her own steam she could make a speed of between 4 and 5 knots, but she was also towed by the powerful tug Stormcock. The weather was bright when the vessel started, but next morning the wind freshened, while dark masses of clouds presaged the bad weather that followed. The gale was at its highest when the vessels were off the Isle of Man, about six o'clock on Thursday evening. The tug cast loose the hawser, which seemed an impediment to navigation, and while the engines of the big ship were stopped for a while, she became practically unmanageable, the gale having full play against her hull, which was very high out of the water. For four hours she was rolled about at the mercy of the seas. Heavy goods on board were dashed about below, while the funnels swayed as if about to be dislodged. Notwithstanding that she stood 40 feet out of the water, some of the seas swept over her, and a large gangway was torn from its chains and carried away. At length she was got to windward, and the course directed to the Irish coast; but the gale moderated, and on Friday morning the Stormcock, which had kept near, resumed the towing of the ship, which reached the bar of the Mersey at five o'clock on Friday evening. There may be many who, but for the loss of life it would have involved, would have been glad to hear that the Great Eastern had foundered in the last gale she rode through, rather than that she should undergo the last indignities of a breaking up. After all, however, many a valiant battle-ship, with a large roll of honor, has shared the same fate. *Sic transit gloria mundi.*—Iron.

Glass Cloth.

Mr. Dubus Bonnet, of Lille, France, has invented a process of spinning and weaving glass into cloth. The warp is composed of silk, forming the body and groundwork, on which the pattern in glass appears, as effected by the weft. The requisite flexibility of glass thread for manufacturing purposes is to be ascribed to its extreme fineness, as not less than from 50 to 60 of the original strands are required to form one thread of the weft. The process is slow, for no more than a yard of cloth can be produced in twelve hours. The work, however, is extremely beautiful and comparatively cheap. A French paper, commenting on the discovery, says: "When we figure to ourselves an apartment decorated with cloth of glass and resplendent with light, we must be convinced that it will equal in brilliancy all that the imagination can conceive and realize; in a word, the wonders of the enchanted palaces mentioned in the Arabian tales."