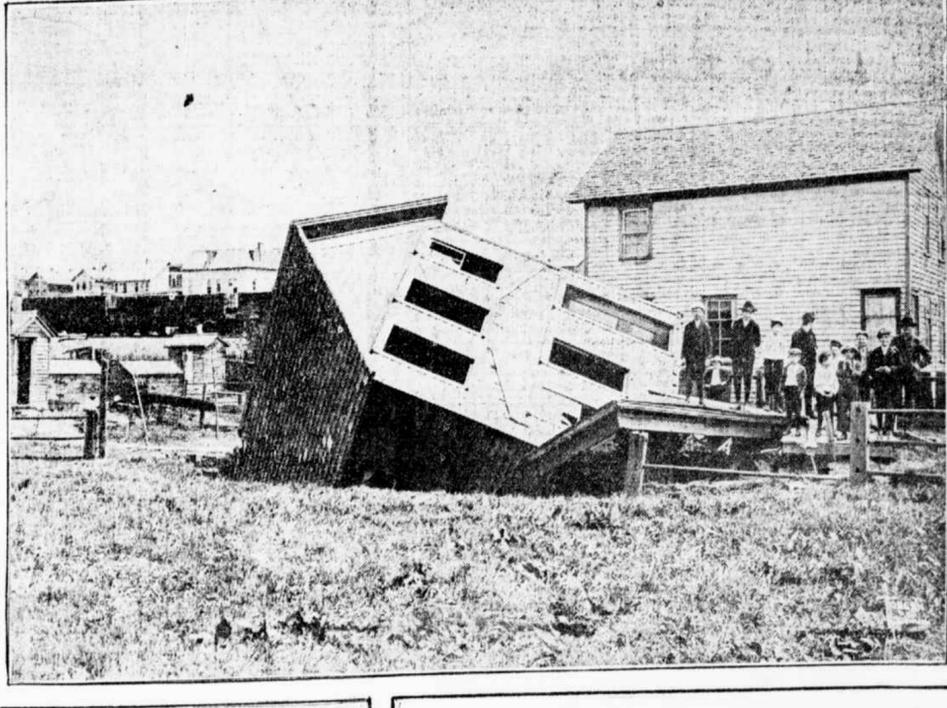
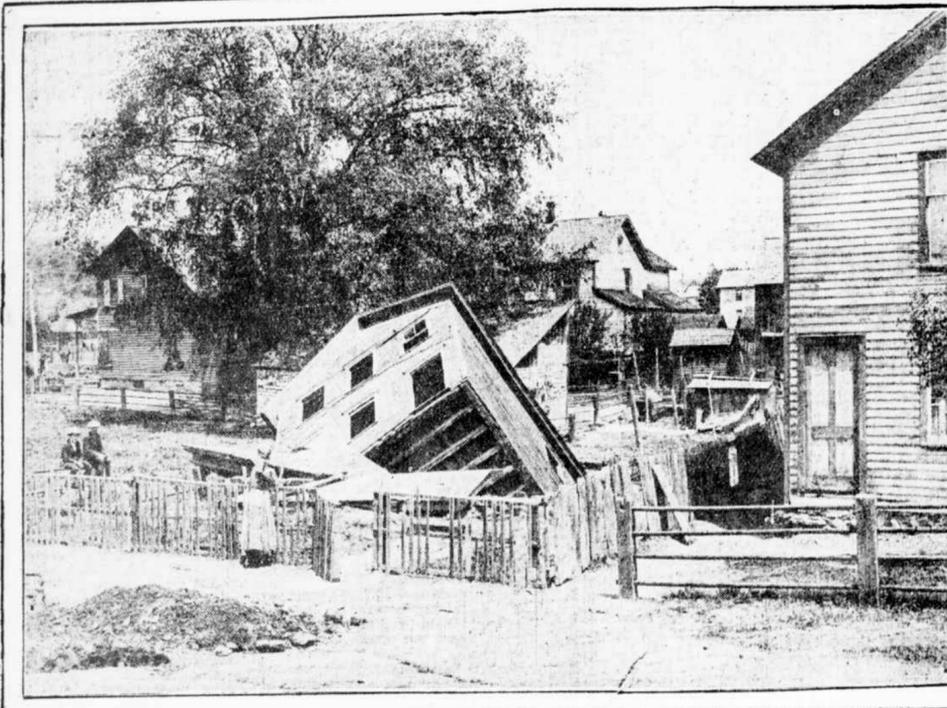


Where Earth's Crust Is Fragile and Cave-Ins Swallow Houses Whole



A SMALL COLLAPSE OF TERRA FIRMA AT MAYFIELD, PENN.

Down in the Undermined Valleys of the Lackawanna and Wyoming Rivers Persons as Well as Buildings Have Been Gobbled Up, and Fear Is Broadcast There.

A SITUATION of affairs unprecedented in human history has arisen in the Lackawanna and Wyoming valleys of Pennsylvania, where over wide areas the crust of the earth is showing signs of caving in. So serious is the problem that the government Bureau of Mines has recently undertaken an investigation of it.

On June 15 last five children were playing together on a public recreation ground at Old Forge, which is about twenty miles from the city of Scranton, Penn. The place was a greensward on a hillside, shaded by trees. Suddenly one of the youngsters, a little girl, disappeared, simply vanished from the sight of her horrified playmates. She had fallen into a mine tunnel which followed a vein of coal near to the surface at that spot, the earth giving way beneath her. Her body was recovered later.

ALARM IN SCRANTON.

Uncertainties of the landscape, due to such cave-ins, have become very alarming of late in many parts of the two valleys, which are extensively undermined by workings for coal, and in the city of Scranton and its vicinity much anxiety is felt on the subject, especially since only a short time ago a schoolhouse broke partly through the earth's crust and threatened to be swallowed up.

That the alarm is by no means groundless may be judged from the fact that, according to an estimate recently made by the government Bureau of Mines, a greater quantity of material has been removed by mining excavation from beneath the city of Scranton than has been dug out of the Isthmus of Panama in the construction of the nearly completed canal.

In the case of the schoolhouse accident above mentioned those who visited the scene after it occurred were able to look directly into the mine tunnel's below. But this was an affair almost trifling compared with something in the same line that happened in Scranton on the 20th day of last November a double dwelling house at Nos. 123 and 125 Ross avenue, occupied by two families, being completely engulfed by a cave-in of old workings in the big vein of the Von Storch colliery.

OCCUPANTS' FORTUNATE ESCAPE.

The escape of the occupants was little short of miraculous. It was just about 5 a. m. and Mrs. Patrick J. Buckley, in one of the houses, had begun to prepare breakfast for her sons, who were to go to work at 6 o'clock. She had lighted the gas range, and was going into the pantry to get some provisions when she felt a sudden convulsion, the building pitching forward toward the street.

Being a long time resident of a region where the expression "terra firma" has become to some extent obsolete, she realized at once that the house was going down into a mine cave, and, screaming an alarm, ran to the outside. A moment later she was followed by her husband and the rest of the family, all in their night clothes. Quick action was necessary, for within ten minutes the main part of the dwelling had gone down into the hole, dragging the kitchen part over on top of it.

Meanwhile a crowd of neighbors had assembled, and three fire companies had arrived on the scene. But, although it was quickly ascertained that the Buckleys were safe, nothing had been heard about the inmates of the other house, a man named Stevens and his wife. It was surmised that they were imprisoned and unable to effect their escape.

CARRIED UP A LADDER.

The two houses, built as one, were steadily sinking, and, if anything was to be done, there was no time to be lost. A young man named Perry, the son of a neighbor, procured a ladder, and, with his father's help, lowered it in such a way that he was enabled to climb into a window of the Stevens house. Whereupon he and Mr. Stevens carried Mrs. Stevens, who was in a state of collapse from shock, up the ladder to the surface.

Thus no lives were lost. But scarcely had the rescue been accomplished when the whole building crashed down into a shapeless mass and fire belched up through the broken timbers above the roofs of houses close by. The firemen quickly got into action, and the dwellings thus threatened were saved, though considerably scorched. Of course, the Stevens and Buckley families lost everything they had.

Occasional items of telegraphic news printed in newspapers in other parts of the country have given no adequate notion of the alarm felt in Scranton and other parts of the anthracite coal region on account of mine cave-ins. One should realize that Scranton itself is a large city, with a population of 150,000 souls, and over extensive areas it is built upon a mere crust. The situation is as if gigantic rats had run vast systems of ramifying burrows underneath the town, thus rendering the very earth unstable.

But, as already stated, the same condition of affairs exists in other parts of the Lackawanna and Wyoming valleys. Many entire towns being similarly undermined. The mine workings in some parts of Scranton, for example, are not more

than ten feet thick and the practice of "robbing" mine pillars, the only support of the surface crust, has been carried on to a most dangerous extent. Often, indeed, the greed of mining operators causes them to remove pillars altogether to get the coal they contain.

The usual method of supporting mine roofs is either to leave solid pillars of untouched coal for the purpose or else to use stones, the latter being built into a pile without mortar or else thrown into a crib resembling a loghouse in its style of construction. The principal objection to pillars of coal is that seams in the material and variations in its texture may render them faulty.

Agitation of the question here discussed has brought about the appointment of a state commission to study mine cave-ins in the anthracite region of Pennsylvania, and to furnish scientific data on which to base definite and exact conclusions. Experiments have recently been made at Lehigh University, in South Bethlehem, in relation to the supporting power of pillars of various materials. For this purpose carloads of materials—such as sandstone, coal, slate, mine timber, fire clay and crushed stone—have been shipped to the laboratory at Lehigh and there built into model mine columns. The machine used to determine their strength being the largest vertical screw-testing apparatus in the world, capable of exerting a pressure of 800,000 pounds.

NO BOTTOM HAS BEEN FOUND.

This, however, is not the only region that suffers, as one might say, from uncertainties of the landscape. At Newk City, Mo., in January of last year, a hole suddenly opened under a millpond, and a great elm tree was literally swallowed into the earth in a cave so large that nothing of the tree was visible a few hours later. The longest rope that could be obtained, with a weight on the end of it for sounding, found no bottom to the cavern. In this instance, however, the hollow beneath the earth was of natural origin.

Not long ago, near the Budweiser Mine, at Tuckahee, a considerable piece of land-



THE CAVE-IN THAT SWALLOWED TWO HOUSES IN SCRANTON LAST FALL.



A CAVE-IN IN STAUNTON, VA., IN WHICH A HOUSE AND A TREE TWENTY-FIVE FEET HIGH DISAPPEARED.

scape fell in, owing to the pumping out of water, incidental to mining operations. Here again was a natural subterranean cavern, and when the water was removed the roof fell in. Owing to similar causes, near the Sand Ridge Mine, at Aurora, great cracks resembling those caused by an earthquake developed in the summer of 1902.

Such facts as these, already known, served to shed light upon the causes of a very remarkable happening in the city of Staunton, Va., where, in the summer of 1910, much alarm was felt lest a large part of the town was destined to drop into the bowels of the earth. A series of cavernous, crater shaped openings in the ground appeared, one house fell through and disappeared and various other associated phenomena excited a not unreasonable dismay.

The trouble began on the 11th day of August, when the occupants of a dwelling on the south side of Baldwin street heard a crash, as if directly underneath them, whereupon the building suddenly shook and sank four feet. In less than an hour it had sunk ten feet, a hole thirty feet in diameter having appeared, and a tree twenty-five feet high presently dropped into the opening, vanishing entirely from sight.

A few hours later the hole caved in at the sides, enlarging considerably, and the

JUST TUMBLED THROUGH THE LANDSCAPE.

There Are Regions in Missouri and Virginia, too, Where Underlying Caverns Have Devoured Slices of the Landscape and Threaten Serious Disasters.

dwelling, which was of two stories and 25 by 25 feet in floor dimensions, finally dropped through and vanished.

Two hours after the first break a second one occurred, on the opposite side of Baldwin street, diagonally across. A loud report, like that of a gun, was heard, and a hole appeared four feet square in front of an engine house. It grew in size at irregular intervals until it reached nearly across the street and under the engine house. Incidentally, the latter was so badly damaged that it had to be torn down afterward. Some hours later a family named Todd, living not far away, heard rumblings and mysterious noises, whereupon a third hole, bigger than either of the other two, began to appear. It was about seventy-five feet southwest of the first opening. Enlarging until it was ninety feet long by sixty feet wide, it swallowed up three trees and a portion of the Todd dwelling. Sounding showed that it was a hundred and fifty feet deep, and water poured into it until it was filled to within twenty-three feet of the surface of the ground.

ANOTHER CAVE-IN FOLLOWS.

Two weeks afterward, on August 27, there was a fourth cave-in, sixteen shaped and twelve feet in diameter, on the opposite side of Lewis street from the third hole.

Among the negroes of Staunton there was a strong impression that the world was coming to an end. Attempts were made to fill up the holes, particularly that which threatened the engine house, by dumping wheelbarrow loads of rocks into them, but they seemed about as effective as if one were to try to choke the crater of Vesuvius with pebbles. What was finally done was to build a concrete arch along the line of the openings, thus reinforcing the earth crust locally and preventing further damage.

For a while the whole affair was regarded as unaccountable, but an investigation set on foot by the government Geological Survey has since furnished a complete explanation, two experts, Messrs. Kindle and Van Horn, being dispatched to the scene for the purpose.

It appears that the trouble was due to a man named Smith, who established an ice-making plant about a hundred and fifty feet from the line of the subsequent caverns. Driving a well to the depth of eight hundred feet, he installed a powerful machine and began pumping water just five days before the cave-ins began.

The cavern had been filled with water, which helped to uphold its roof. But when the water was removed by pumping for the ice plant the roof could no longer sustain itself and fell through in spots.

RENEE BACHE.

Kate Carew Talks With Mr. Waldo

Continued from third page.

of burglarizing premises, in the first instance with a revolver in his possession. In the first two cases he was found guilty and paroled. In the third case he was sentenced to the House of Refuge.

One man who was convicted of a most revolting murder, after a lapse of twenty months, was not executed.

Two men who had entered the premises occupied by an aged broker and murdered his victim was sentenced to twenty years' imprisonment.

In one instance a man at night who was driving away with a horse and cab which did not belong to him. The policeman was obliged to fire several shots in the air before he could make the fugitive stop. He charged him with grand larceny. The magistrate directed that the charge be changed to one of disorderly conduct and fined the man \$5.

In one instance a magistrate refused a warrant on the ground that the evidence had been obtained by a policeman who merely saw the set by looking through a window, but was not in the room.

In almost all cases where roulette wheels and other gambling apparatus have been seized in raids, court orders were obtained requiring the return of the property to the gamblers.

The last eight paragraphs are quoted from the annual report, ended December, 1911, at Police Commissioner Waldo's suggestion, as they answer several of the interrogations made to him.

We shook hands.

"Goodby, Miss Carew," said he. Just as cordially as he had welcomed me. A little more, perhaps.

I wonder if that was due to the charm of my manner or if he was simply speeding the parting interview.

I have my own ideas!

I toddled on the elevator, said "Good day" to the elevator man.

Nodded to Lieutenant Shaw, who was just as handsome as when I came in.

Saluted the White Soul. Waved a ray challenge to the stone lions. Think of any one being afraid of them!

Mr. Rhinelandt Waldo certainly lends a lot of good qualities to the Force. Perhaps he gives them.

I can't help thinking, however, that he missed several fine opportunities. Those questions about the stone throwing Suffragettes, the political cabals, the probability of Women on the Force. Why, he could have talked for hours and told me no end of secrets.

Incidentally, I remarked to him, just before he said "Goodby":

"You have given me a charming interview, Mr. Waldo."

And he said—now what do you think he said? Guess? That I was a—

Good Listener. Do you agree with him?

THE VERDICT.

Mrs. Hamilton Fish Webster at a luncheon in Newport said of a young girl who had just returned from Paris:

"She studied, you know, under De Reszke. They tell a story about her."

"One afternoon in presence of the whole class she sang an aria of Puccini's. All while she was singing the maestro walked up and down muttering 'Mon Dieu! Peste!' and such like expressions. When she finished everybody looked at him expectantly, anxious to hear the final verdict."

"M. de Reszke strode up to the girl, laid his hand on her shoulder in a gentle, fatherly way and delivered his verdict in a murmur."

"Ma chere," he said, "marry soon, Goodby!"

A VOTER.

Mrs. O. H. P. Belmont, at a tea at the Colony Club, in New York, said with a smile:

"I have no vote, but my groom has."

She smiled bitterly and added:

"I admire my groom for his proficiency, but I'm quite sure that if I went to him next November and said, 'Well, James, are you going to exercise the franchise?' he would touch his rosy forehead with his forefinger and respectfully reply:

"Please, madam, which horse is that?"

MARTIAL MUSIC.

George Ade, with a touch of pessimism as to matrimony, said at a recent wedding breakfast in Chicago:

"To me wedding music always suggests the music of soldiers going hopefully and bravely into battle."



CHARLES EUZIAN, EXPERT OF BUREAU OF MINES.

UNDERMINING THE LANDSCAPE WITH ELECTRICAL COAL-DIGGING MACHINES.

It seems that the city of Staunton is in a limestone region. In fact, a bed of limestone fifteen hundred feet thick underlies the town. As in other limestone districts, there are subterranean streams, one of which had excavated a large cavern directly beneath the place where the cave-ins occurred. The cavern grew in size until the roof became too weak to hold itself up any longer, and then it fell in.

In the limestone region of Kentucky there are hundreds of underground stream channels marked by cave mouths and sink holes. More than five hundred caverns of various sizes are known in three counties in the vicinity of the great Mammoth Cave. Over considerable areas of Indiana likewise more than nine-tenths of the rainfall is carried off by such streams, which collect the surface waters largely through hopper-shaped depressions, called sinks or sinkholes.

Often the outlet of a sinkhole, connecting it with the stream below, is choked by plug and the sink becomes first a pond or small lake, then a marsh, and later on, when filled in with silt, dry land. This, in fact, is what happened at Staunton. But the cavern below remained, with the stream, since located by borings for a considerable distance, running through it.

What finally happened to bring about the catastrophe (according to the report made by Mr. Kindle) was remarkable. For