WEB OF STEEL

By CYRUS TOWNSEND BRADY FATHER AND SON

YOUNG MEADE MAKES A DISCOVERY WHICH TERRIFIES HIM AND HE TRIES TO SAVE MANY LIVES

The Martlet Construction company is putting up a great international bridge planned by Bertram Meade, Sr., a famous engineer. His son, Bertram Meade, Jr., resident engineer at the bridge, is in love with Helen Illingworth, daughter of Colonel Illingworth, president of the construction company, and they will marry as soon as the bridge is complete. The young engineer questioned his father's judgment on the strength of certain important girders, but was laughed at. His doubts are verified, however, and he makes desperate efforts to stop construction, fearing great loss of life.

CHAPTER IV—Continued.

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But Meade was out of the house. It was summer and the sun had set, but the long twilight of the high latitude still lingered. Before him rose the gigantic structure of the bridge. For all its airiness it looked as substantial as the Rock of Gibraltar, and it looked even more substantial if possible, as the man, seizing a lantern and, forgetting his weakness, ran down beneath the overarching steel to the pierhead, climbed up to the shoe, and crawled out on the lower chord as rapidly as he could.

Meade needed but one glance to see the deflection from the right line in the important member. For all his years of inexperience he was a better trained engineer than rough-and-ready Abbott. What appeared to the latter as a slight deflection, Meade saw in its true relation. There was a variation in the center of the member of an inch and a half at least, although unnoticeable to an untrained eye. It had all come in the last week. They had extended the suspended span far out beyond the edge of the cantilever and, with the heavy traveler at the end, the downward pressure on the great lower chord members had greatly increased.

It was a terribly heavy bridge at best. It had to be to sustain so long a span, the longest in the world. And the load, continuous and increasing, had brought about this, to the layman trifling, to the engineer mighty, bend. If it bent that way under that much of a load, what would it do when the whole great span was completed and it had to carry its transitory loads of traffic beside?

When two different views meet it is natural that age, experience, reputation and authority shall carry the day. Although Bertram Meade, Jr., had never been persuaded in all particulars of the soundness of his father's design, and could not be persuaded, that vast experience, that great reputation, that undoubted ability with its long record of brilliant achievement had at last silenced him. He had accepted through loyalty that which he could not accept in argument. Once accepted, he acted accordingly, heartily seconding and carrying out the wishes of the older and, as the world would say, the abler man.

The thing that smote the engineer hardest was that this weakness was exactly what he had foreseen and pointed out. It was the possibility of the inability of this great member to carry the stress that young Meade had deduced by using the formula of Schmidt-Chemnitz. It was this point, and this point particularly, that he had dwelt upon with his father and which they had argued to a finish. So strongly had he been impressed with the possible structural weakness of this member that he had put himself on record in writing to his father. The old man had overborne him and now the little curve, one and a half to one and three-quarter inches in sixty feet, established the accuracy of his unheeded contention. Vainly now he wished he had not let the old habit of affection and the little touch of awe with which he regarded his father persuade him against his reason.

He stopped, feeling suddenly ill, as a very nervous high-strung man may feel under the sudden and unexpected physical shock. He was weak still from the tonsilitis. He leaned against the diagonal at the end of C-10-R, clinging to it tightly to keep from falling. Abbott, who had followed more slowly, stopped by him, somewhat surprised, somewhat amused, more indignant than both.

"Abbott," said Meade fiercely as the erecting engineer joined him on the pierhead, "if you put another pound of load on that cantilever I will not be answerable for the consequences."

"What do you mean?"

"That deflection is nearly two inches deep now and every ounce or pound of added weight you put upon it will make it greater. Its limit will be reached mighty soon. If it collapses—" he threw up his hands—"the whole thing will go."

"Yes, if it collapses, that's true," said Abbott, "but it won't."

"You're mad," said Meade, taking unfortunately the wrong course with the older man.

"Why, boy," said Abbott, "that bridge will stand as long as creation. Look at it. That buckle doesn't amount to anything. It is only in one truss anyway. The corresponding member in the other truss is perfectly straight."

"Abbott, for God's sake, hear me," pleaded Meade in desperation. "Draw back the traveler and put no more men on the bridge. Stop work until we can get word to—"

"Don't talk to me, boy. I know my business. I tell you I can jack it back. That member's big enough and strong enough to hold up the world."

"What are you going to jack against?" Meade asked, and for the first time a little of Abbott's contempt appeared in the younger man's voice.

Abbott reflected that there was nothing firm enough to serve as a support for jacks and said rather grudgingly, for it seemed like a concession to the younger and junior engineer:

"Well, I can hook on to the opposite truss and pull it back with turn buckles."

"That will damage the other truss too much, Abbott," Meade retorted promptly. "It isn't possible."

"Then I'll think up some other scheme," returned Abbott indifferently, as if humoring the other. "We can't wait, we've got to hurry it along. There's going to be no penalty against us on account of me. I won't stop work a minute," he explained patronizingly.

"There will be a bigger penalty if you don't do what I say, and paid in another way, in blood. And it will be your fault."

Now both men were angry and in their passion they confronted each other more resolute and fierce than ever.

"Look here," said Abbott, his fiery temper suddenly breaking from his control, "who are you anyway? You're only a kid engineer. Your father approved of the plan of this bridge. I guess we can afford to bank on his reputation rather than yours."

"Well, he doesn't know of this."

"Nobody is on the bridge now, and nobody is going to be on there until tomorrow morning. Wire him if you like. He'll wire Illingworth down at Martlet and we'll get word what to do."

"You won't put any men at work on the bridge until—"

"Not until tomorrow morning," said Abbott decisively, "if I don't hear from

He Stopped, Feeling Suddenly Ill.

somebody at Martlet tomorrow morning the work goes on."

"But if my father wires you—"

"I take orders from the Martlet company and no one else," was the short answer with which Abbott turned away in finality, so that the other realized the interview was over.

Meade wasted no more pleas on Abbott. As ill luck would have it something had happened to the telephone and telegraph wires between the city and the camp. Meade dressed himself, got a handcar, and was hurried to the nearest town on the railroad's main line. From there he sent a telegram and tried to get connection with New York by telephone, but failed. Moved by a natural impulse, in default of other means of communication, he jumped on the midnight train for New York. He would go himself in person and attend to the grave affair. Nothing whatever could be so important.

There had been some friction between Abbott and Meade before on occasions, not serious, but several times Meade had ventured to suggest something which to Abbott seemed useless and unnecessary, and the fact that subsequent events had more often than not proved Meade's suggestions to be worth while, had not put Abbott in altogether the best mood toward his young colleague. Abbott never forgot that Meade had really no official connection with the building of the bridge, and that he was only there as a special representative of his father, and although he could not help liking the younger man, Abbott would have been better pleased if he had been left alone.

Meade had not gone about it in the right way to move a man of Abbott's temperament. He realized that as he lay awake on the sleeper speeding to New York. Abbott was a man who could not be driven. He was a tremendous driver himself and naturally he could not take his own medicine. If Meade had received the announcement more quietly and if he had by some subtle suggestion put the idea of danger into Abbott's mind all would have been well, for when he was not blinded by prejudice, or his authority or his ability questioned, Abbott was a sensible man thoroughly to be depended upon. But the news had come to Meade with such suddenness, Abbott had only casually mentioned it at the close of a lengthy conversation regarding the progress of the work as if it were a matter of no special moment, that the sudden shock had thrown Meade off his balance.

Therefore he could see nothing but danger and the necessity for action. How he should handle his superior, or rather the bridge's superior, was the last thing in his mind. Aside from his natural pride in his father and in the bridge and his fear that lives would be lost if it failed, unless he could get the men withdrawn, there was the complication of his engagement to Helen Illingworth.

Meade could not close his eyes, he could not sleep a moment on the train. His mind was in a turmoil. Prayers that he would get to his father and the bridge people in time to stop work and prevent loss of life, schemes for taking up the deflection, strengthening the member, and completing the bridge, and fears that he would lose the woman, stayed with him through the night.

CHAPTER V.

The Death Message.

Meade, Sr., was an old man. Although unlike Moses his eye was dim and his natural force abated, the evidences of power were still apparent, especially to the observant. There rose the broad brow of the thinker. His power of intense concentration was expressed outwardly by a directness of gaze from the old eyes which, though faded, could flash on occasion. Other facial characteristics of that snow-crowned, leonine head, which bespoke that imaginative power without which a great engineer could not be in spite of all his scientific exactitudes, had not been cut out of his countenance by the pruning knife of time.

He was a great engineer and looked it, sitting alone in his office with the telegram crushed in his trembling hand, despite the fact that his gray face was the very picture of unwonted weakness, of impotency, and abiding horror. The message had struck him a terrific blow. He had reeled under it and had sunk down in the chair in a state of nervous collapse.

The telegram fairly burned the clammy palm of his hand. He would fain have dropped it yet he could not. Slowly he opened it once more. Ordinarily, powerful glasses stimulated his vision. He needed nothing to read it again. It is doubtful whether his eyes saw it or not and there was not need, for the message was burned into his brain.

He read again the mysterious words:

One and three-quarter-inch camber in C-10-R.

There could be no mistake. The name that was signed to it was the name of his son, the young engineer, the child of his father's old age. The boy, as the old man thought of him, had ventured to dispute his father's figures, to question his father's design, but the elder man had overborne him with his vast experience, his great authority, his extensive learning, his high reputation. And now the boy was right. Strange to say some little thrill of pride came to the old engineer at that moment.

He tried to find out from the telegram when it had been sent. That day was a holiday—the birthday of one of the worthies of the republic—in some of the United States, New York and Pennsylvania among them, and only by chance had he come down to the office that morning. The wire was dated the night before. And he recalled that the state from which the bridge ran did not observe that day as a holiday. They would be working on the International as usual unless—

One and three-quarter inches of deflection! No bridge that was ever made could stand with a bend like that in the principal member of its compression chord, much less so vast a structure as that which was to span the greatest of rivers and to bring nation into touch with nation. He ought to do something, but what was there to do? Presently, doubtless, his mind would clear. But on the instant all he could think of was the impending ruin.

The Uplift building, in which he had his offices, was mainly deserted on account of the holiday. The banks were closed and the offices and most of the shops and stores. It was very still in the hall and, therefore, he heard distinctly the door of the single elevator in service open with an unusual crash, then the sound of rapid footsteps along the corridor as of someone running. They stopped before the outer door of the suite which bore his name. Instantly he suspected a messenger of disaster. The door was opened, the office was crossed, a hand was on the inner door. He sank back almost as one dead waiting the shock, the blow.

"Father," exclaimed the newcomer. "You got my telegram?"

The other silently exhibited the crumpled paper in his hand.

"What have you done?"

"It's a holiday, don't you know? I only got it a few moments ago. The bridge?"

"Still stands."

"But for how long?"

"I can't say. The Martlet's resident engineer is mad. I begged, threatened, implored. I tried to get him to stop work, to take the men off the bridge, to withdraw the traveler, but he won't do it. Said you designed it, you knew. I was only a cub."

"But the camber?"

"He said, 'I'll jack it into line again.' Like every other engineer who sees a big thing before him it looks to him as if it would last forever. I tried to get you on the telephone here and at the house last night and failed. I wired you. Then I jumped on the midnight express and—"

"What is to be done?" asked the old man.

Meade, Sr., was thankful that the younger man had not said, "I told you so," as well he might. But really his father's condition was so pitiful that the son had not the heart.

"Telegraph the Martlet Bridge company at once," he answered.

"What shall we say?" asked the old man, uncertainly.

The young man shot a quick look at him, that question evidenced the violence of the shock. His father was old, broken, helpless, dependent, at last. . . .

"Give me the blank," he answered. "I'll wire in your name."

He repeated the telegram that he had sent to his father and added these words as he signed the old man's name to it:

Put no more load on the bridge. Withdraw men and traveler.

"I can't understand why we don't hear," said the young engineer two hours later, walking up and down the room in his agitation. "Two telegrams and now we can't get a telephone connection, or at least any answer after our repeated calls."

"It's a holiday there as well as here," said the older man. "There is no one in the office at Martlet."

"I'll try the telephone again. Someone may come in at any time."

He sat down at the desk, and after five minutes of feverish and excited waiting he finally did get the office of the Martlet Bridge company. By a happy fortune it appeared that someone happened to come into the office just at that moment.

"This is Meade," began the young man, "the consulting engineer of the International bridge. Well, at ten-thirty this morning I sent a telegram to Colonel Illingworth and an hour later I sent another. What's that? Both telegrams are on the desk? Give me your name—Johnson—you're one of the clerks there? Well, telephone Colonel Illingworth at his home—what! He isn't at home? Is the vice president there—the superintendent—anybody? How far away are they? Twenty miles! There's no telephone? Now, listen, Johnson, this is what you must do. Get a car, the strongest and fastest you can rent and the boldest chauffeur, and a couple of men on horses too, and send up to that place wherever they are, and tell Colonel Illingworth that he must telephone me and come to his office at once. There are telegrams there that mean life or death and the safety of the bridge. You understand? Good. He says he'll do it, father. We've done all we can," he added. He hung up the receiver, sprang to his feet, looked at his watch. "It's so important that I'll go down there myself. I can catch the two o'clock train, and that will get me there in two hours. You stay quietly here in the office and wait until I get in touch with those people. I mean, I want to know where I can reach you instantly."

"I'll stay right here, my boy. Go, and God bless you."

As usual when in a great hurry there were unexpected delays and the clock on the tower above the big structural shop was striking five when a rickety station wagon, drawn by an exhausted horse, which had been driven unsparingly, drew up before the office door. Flinging the money at the driver, Meade sprang down from his seat and dashed up the steps. He threw open the door and confronted Johnson.

"Did you get him?" he cried.

"He isn't here yet. I sent an automobile and two men on horseback and—"

The next minute the faint note of an automobile horn sounded far down the valley.

"I hope to God that is he," cried the young engineer, running to the window.

"That's the car I sent," said Johnson, peering over his shoulder. "And

All He Could Think of Was the Impending Ruin.

there are people in it. It's coming this way."

"Johnson," said Meade, "you have acted well in this crisis and I will see that the Bridge company remembers it."

"Would you mind telling me what the matter is, Mr. Meade?"

"Matter! The International—"

"Bert," exclaimed a joyous voice, as Helen Illingworth, smiling in delighted surprise, stepped through the open door and stood expectant with outstretched hands.

Young Johnson was as discreet as he was prompt and ready. He walked to the window out of which he stared, with his back ostentatiously turned toward them. After a quick glance at the other man, Meade swept the girl to his heart and held her there a moment. He did not kiss her before he released her. The woman's passionate look at him was caress enough and his own adoring glance fairly enveloped her with emotion. Johnson coughed and turned as the two separated. It was the woman who recovered her poise quicker.

"What were you saying about our bridge when I came into the room?" she began, and Meade fully understood the slight but unmistakable emphasis in the pronoun—our bridge, indeed—"I was lying down this afternoon, but when I awakened my maid told me about your urgent calls for father," she ran on, realizing that some trouble portended and seeking to help her lover by giving him time. "I knew something must be wrong, so I came here. I didn't expect to see you. Oh, what is it?" she broke off, suddenly realizing from the mental strain in her lover's face, which the sudden sight of her had caused him to conceal for a moment, that something terribly seri-

Into the Room Burst Colonel Illington.

ous had happened, and she turned a little pale herself as she asked the question, not dreaming what the answer would be.

"Helen," said the young man, stepping toward her and taking her hands again, "we're in awful trouble."

"If it is any trouble I can share, Bert," said the girl, flashing at him a look which set his pulses bounding—at least she was to be depended on—"you know you can count on me."

"I know I can," he exclaimed gratefully.

"Now tell me."

"The International bridge is about to fall."

The color came to her face again. Was that all? came into her mind. That was serious enough, of course, but it would not matter in the long run. Helen realized the awful gravity, the terrible seriousness, of the situation of course. The bridge meant much to her even if in quite a different way. It was there he had saved her from the awful fall. It was there that he had told her that he loved her. The bridge might fall, but it was as eternal as her affection in her memory. Their engagement, or their marriage, had been made dependent upon the successful completion of the bridge. What of that? The proviso meant nothing to her when she looked at the white-faced agonized man to whom she had given herself.

"It is terrible, of course," she said quietly. "But you can do nothing?"

"If I could, do you think I'd let the bridge, and you, go without—"

"I'm not going with the bridge," was her quick and decisive interruption.

They had both forgotten the presence of young Johnson, who was not only decidedly uncomfortable, but desperately anxious. He was about to speak when, into this already broken scene, came another interruption.

There was a rush of wheels on the driveway outside, the roar of a motor. Before Meade could answer the statement, into the room burst Colonel Illingworth. He was covered with dust, his face was white, his eyes filled with anxiety. The character of the summons had disquieted him beyond measure. Back of him came Severence, the vice president, and Curtiss, the chief engineer.

"Meade, what of the bridge?" he burst out, with a quick nod to his daughter. Colonel Illingworth had not stopped to hunt for a wayside telephone. The automobile driven madly, recklessly through the hills and over the rough roads, had brought him directly to the office in the shortest possible time.

"There is a deflection one inch and three-quarters deep in one of the compression members, C-10-R," was the prompt and terrible answer.

Colonel Illingworth had not been president of the Martlet Bridge company for so long without learning something of practical construction. He was easily enough of an engineer to realize instantly what that statement meant.

"When did you discover it?" he snapped out.

"Last night."

"Is the bridge gone?"

"Not yet."

"Why didn't you let us know?"

"I telegraphed father and, not hearing from him, I came down on the midnight train. It is a holiday in New York as well as here. I just happened to meet father in the office. He sent a telegram to you and not hearing from you, duplicated it an hour later. I tried half a dozen times to get you on the telephone and finally, by a happy chance, got hold of young Johnson."

"Where are your father's telegrams?"

"Here."

Colonel Illingworth tore the first open with trembling fingers.

"Why didn't you tell Abbott?" asked the chief engineer.

"You know Abbott. He said the bridge would stand until the world caved in. Said he could jack the member into line. He wouldn't do a thing except on direct orders from here."

"Your father wires, 'put no more weight on the bridge.' What shall we do?" interposed Colonel Illingworth.

"Telegraph Abbott at once."

"If the bridge goes it means ruin to the company," said the agitated vice president, who was the financial member of the firm and who could easily be pardoned for a natural exaggeration under the terrible circumstances.

"Yes, but if it goes with the men on, it means—Johnson, are you a telegraph operator?"

"Yes, sir."

"Take the key," said the colonel, who, having been a soldier, thought first of the men.

Johnson sat down at the table where the direct wire ran from the bridge company to the telegraph office. He reached his hand out and laid his fingers on the key. Before he could give the faintest pressure to the instrument, it suddenly clicked of its own motion. Everybody in the room stood silent.

"It is a message from Wilchings, the chief of construction foreman of," Johnson paused a moment, listening to the rapid click—"the International—" he said in an awestruck whisper.

It had come!

"Read it, man! Read it, for God's sake!" cried the chief engineer.

"The bridge is in the river," faltered Johnson slowly, word by word, translating the fearful message on the wire. "Abbott and one hundred and fifty men with it."

What happens after the crash is told in the next installment. What happens to the Meades and Illingworths, and the vast trouble stirred up, makes thrilling chapters.

(TO BE CONTINUED.)

GOLD FROM FLOOR TO CEILING

Wonderful Accumulation of Yellow Metal Stored in the Assay Office at New York.

The New York assay office is now the most important institution of the kind in the world. There is more gold stacked up in boxes and kegs, in bricks and bars, in bins and bags, than ever before in the history of the country. The assay office, says the New York World, is the purchasing agent for the government. Foreign gold, consigned to banks and trust companies, is "cashed in" through the assay office.

British sovereigns, packed in boxes, are piled as high as the ceiling. Dodging that golden bulwark, the visitor is likely to bump into the cases full of French twenty francs that are piled on the other side. Turning to reach the elevator, he skirts a row of gold bars, packed five ten-thousand-dollar bars to the keg, in sawdust, and stretching along the wall twice the height of a man.

All gold, of whatever nature, is melted and refined to a fineness of 999.5, or finer, and cast into bars of standard sizes. The value of each bar is expressed in United States dollars and cents. Every bar and coin has to stand the acid test.

There are 15 big melting pots at work on gold exclusively. It seems almost brutal to see the workmen scoop shovelfuls of gold pieces from metal boxes and dump them, one after another, into a pot until it is full, and then clap on the lid and wait for them to stew!

Waste Bark Replaces Rags.

A method of using waste hemlock tan bark to replace partially expensive rag stock in the manufacture of felt roofing has been developed at the forest products laboratory at Madison, Wis., and is now being used commercially by co-operating mills, according to an announcement made by the forest service. It is stated that in these mills from 20 to 30 per cent of the rags is being replaced by waste bark and that the quality of the finished product is equal to that manufactured solely from rags. Members of the forest service who have been conducting the experiments say that the utilization of the bark will make it possible to effect a considerable saving in the manufacture of felt roofing.

Exploration of New Guinea.

A few years ago elaborate plans were laid in Germany to explore the hitherto inaccessible interior of New Guinea by means of balloons, which were expected to drift over the island in the prevailing winds. The project was much discussed in the magazines and subscriptions were solicited in its behalf, but it was never carried out. It is now reported in the newspapers that Dr. Eric Mjorberg, a Swede, is planning to make use of an airplane to explore the interior of New Guinea, and is in the United States investigating the latest improvements in aviation.

Beware the Loaded Gun.

The man who returns from hunting and sets his loaded gun in the corner or hangs it on the wall is, in reality, setting a death-trap. Yet it is surprising how often this is done. The gun we "didn't know was loaded," is an old, old story, says Farmer's Guide.

You cannot be too cautious. The loaded gun you may keep on the wall to shoot crows with when they get in the corn is liable to cause you more loss than a million crows can. It takes only a second to put a cartridge in a gun when the time is at hand. It takes no longer to take it out.

Absurd.

"My husband has the queerest ideas of economy."

"Indeed?"

"Why, he actually seems to think I could save money by staying away from bargain sales."

High Cost of Art.

"Many great composers died poor."

"Yet they had their chance to economize. Think of the money they saved by being able to hear their own music without paying!"

Blossom Remains.

Bacon—"Crimsonbeak says his wife keeps his nose to the grindstone." Egbert—"Well, it doesn't seem to wear the red off of it."

His Qualifications.

"A tailor ought to make a good lover."

"Why so?"

"He can always warmly and effectually press his suit."

No News a Nuisance.

"No news is good news."

"My wife says that doesn't apply to society news."

Differences.

"A mascot is not always a mascot."

"That's so, and a Jonah often ends in a wail."

Up to Date.

Sunday School Teacher—Willie, who was born in Bethlehem?

Willie—Charles M. Schwab.

"Glad to meet you," is what one man usually says when introduced to another—but is he?