WEB OF STEEL

By

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TRY AS HE WILL TO CONCEAL HIS EXPERT KNOWLEDGE OF ENGINEERING, MEADE FAILS AND PROMOTION COMES TO HIM RAPIDLY AT THE DAM

Following the collapse of a great bridge which his father, a noted engineer, had planned, and the old man's sudden death from disgrace and shock, Bertram Meade takes the blame for the disaster which cost many lives and disappears from his home in New York. He goes to the Southwest, gets a job under the name of Roberts on an irrigation dam project and makes good. Meanwhile Helen Illingworth, Meade's sweetheart, and Rodney, an old friend, are quietly working to clear the young man's name and to learn his whereabouts. They are particularly anxious to get possession of a letter written by the elder Meade to assume responsibility for the accident. This paper is secretly held by Shurtliff, who had been the old man's devoted private secretary for many years.

CHAPTER XII—Continued.

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"I believe you are right," said Rodney, leaning back in his chair and staring at her through his glasses. "If we can only make him speak— But where is he?"

"Working for my father."

"What do you mean?"

"I mean that I suspected him from the first, and as there was an opening for a private confidential man, who understood engineering—a vacancy made by the promotion of my father's private secretary—I prevailed upon him to give the position to Shurtliff. Father hates the name of Meade, but he worships efficiency and he knows that Shurtliff is the very incarnation of the particular kind of ability that he desires, so he is with my father constantly and I have him always under my eye. When we go away in the car, he goes along."

"What are you going to do?"

"Win his confidence, his affection if I can, appeal to him, and—"

"By Jove," said Rodney, "I believe you can do it. You can't drive that old man."

"I know it," said the woman.

"You haven't told him that you thought it was his fault?"

"No."

"I couldn't do anything with a man like Shurtliff. You can. You can win his devotion, you can let him see how much the reinstatement of Bert Meade in honor again means to you. You can do it."

"Meanwhile you will help me, won't you?"

"In any way, in every way. Do you know where he has gone?"

"I haven't the slightest idea. He might be in Africa, or South America, or out West, or up North. Do you see those flowers?"—she pointed to a great bunch of American Beauty roses, which had been forced for her apparently, and which she had received on that very day—"Dards, you know, the Madison avenue florist, sends me a box of magnificent blossoms—roses, violets, orchids, always different—every week. They speak to me of him."

"Have you ever tried to trace them?"

"No. I know whence they come and that is all. We will hear from him some day, somewhere, somehow. Meanwhile we will work, work, work!"

He Had a Natural Instinct for Topography.

"And you will allow me to say before I go that since I have had this conversation with you I do not see how even love for his father or his family name would have led Meade to do it."

"Don't say anything against him," said Helen Illingworth quickly. "He was mad with anxiety, shame, regret. Whatever he did, I love him just the same."

CHAPTER XIII.

Working Up.

The autumn went by as a dream. Winter, warm and mild in that far southern clime, was at hand before Meade realized it. An ordinary engineer of half the ability of Bertram Meade, so suddenly reduced to the ranks, would have chafed against the position of subordination and would have resented the humble duties with which he was charged. But Meade was happy to be following, even in this extremely modest way, the profession that he loved. And he did his unimportant work with zeal and care. It is not much to say, but he was the most efficient of the junior engineering force on the dam.

It was not because Meade was unsocial that he kept to himself—not at all. From his own galvanized-iron quarters he used to stare longingly at the men grouped around the big campfires, for the nights were growing chill, smoking and laughing, exchanging experiences and telling stories. Nothing would have pleased him better than to have joined in, and he could have told stories and related experiences that would have been unique even in that gay crowd of young adventurers. But he did not dare. He feared to betray himself. What he wanted above everything was to preserve his incognito. It would be fatal to his chances of ever working up to anything worth while if they found out who he was.

And he had a tremendous pride to sustain him. They respected him now. As a matter of fact, they put his withdrawal of himself down to vagaries of temperament or causes they could not imagine, and they grew rather to like him even as they left him alone. And a few of the men of the humbler sort to whom he had been kind on occasion, and helpful, were stoutly devoted to him.

The idleness of an aimless life did not appeal to him even in his off-duty periods. Doing nothing had no attraction. He could not get relief that way. Even rambling alone about the hills would not serve. So quick and active a man, so vigorous and buoyant a spirit, so strong a body and mind were not calculated for aimless wandering.

Meade was a very accomplished engineer indeed. There was no branch of the art about which he did not know a little, although hydraulics and structural steel were the things that most appealed to him. He got relief in the duality of his affections for these branches of his profession. Neither one of them ever palled on him because he did not work monotonously at either of them. He had a natural instinct for topography, and instead of purposelessly strolling about the country, he made a careful inspection of the valley which was to be converted into a huge reservoir by the dam.

The dam itself was, perhaps, an eighth of a mile long at the bottom and touched the receding hill on one side and the spur of Spanish mesa on the other at the top—a huge mound of earth with a clay core extending from side to side at the narrowest part of the valley. When completed it would be 125 feet high above the old river bed, with a roadway 20 feet broad on top of it. Below the dam and on the low ground between the mesa and Baldwin's knob the camp, with its galvanized iron shops, bunkhouses, dining halls, kitchens and officers' quarters, had been erected. The configuration of the ground was such that, although it was unusual to put them there, convenience had rendered it desirable in this case.

It was intended to complete the dam before the early spring of next year, which was, if any time in the country could be so characterized, the rainy season. Of course, just as soon as the dam had begun to rise, the flow of the Picket Wire below it had been stopped, except when an occasional freshet had been allowed to pass the undersluice. It was known that the run-off of the river in the rainy season of some years was so small as scarcely to fill the reservoir, and it had been decided to store all the flow of the autumn and winter so that even if the spring rainy season were deficient, the beginning of the next summer would find the reservoir full and the new irrigation system could commence operations successfully.

Vandeventer, like the lost Abbott of the International, was also a driver, who spared neither his men nor himself. The work had proceeded with astonishing rapidity, although this was partially accounted for by the fact that the spillway, which should have occupied their attention, had as yet been only partially excavated. Now, to those ignorant of engineering, an earth dam may seem a temporary expedient, although most of the great irrigation dams of the world are of that character; and everybody knows that if the water should rise high enough to overflow an earth dam it would not last longer than it takes to describe its utter giving way. A flood would sweep it out of the way at once.

The device whereby possible floods are controlled and such dangers averted, consists of a broad channel at one side of the dam, and at such a distance below its crest that if, through any mischance or natural happening, such as the failure of the sluice gates, excessive rains, cloudbursts, or floods, the height of the water is increased until it promises to overflow the dam, this opening will carry off the surplus harmlessly. An earth dam without a spillway would presage almost certain destruction to all who lived in the valley below it.

In the case of the Picket Wire dam, the spillway had to be cut and, in part, blasted out of the mountain side—that is, through the spur of the mesa, which reached down from its high wall towards the narrows. There had been a series of blunders and mishaps, which included the explosion of a shipment of dynamite on the railroad, with very disastrous consequences to accompanying rock crushers and mixers, and other machinery. The spillway had not been completed. Its opening should have been about twelve feet below the level of the dam. Vandeventer was not responsible, of course. The chief engineer had fumed and protested, but had been directed by headquarters to go ahead with the other work and tackle the spillway later. There was, indeed, little reason to hold up the building of that particular dam because of the noncompletion of the spillway.

That was a country, so the most devoted inhabitants freely admitted, in which it was always safe to bet that it would not rain, no matter how threatening might be the appearance of the sky; for in ninety-nine times out of a hundred the negative would win the bet. Said inhabitants did not say the hundredth time might compensate for all the other failures. The weather was like the little girl with the proverbial curl—when it did rain there was no doubt in anybody's mind as to the fact. Sometimes the fountains of the great deep, which, in Holy Scripture at least, extended overhead, would be broken open and the violence of the fall and the quantity of it, and suddenness of it, would be such that the Westerners would graphically call it a "cloudburst," which, indeed, it seemed to be.

Outside the rainy season cloudbursts were unheard of, and even in that season extremely rare. For the valley of the Picket Wire and in the plain beneath carefully tabulated reports of the rainfall for years had been considered by the engineers. They had chosen the right season for the building of the dam, but when its crest began to rise above the designed level of the spillway the delay in opening the channel gave cause for some alarm. It is not the probable or certain that is feared. An old version that, of "omne ignotum pro magnifico"—it is only the unknown of which men are afraid, or only the unknown to be feared! Still there was nothing Vandeventer could do but obey orders and go ahead. The danger, after all, was trifling. Another consequence of the waiting was that in his inability to work on the spillway, he had more hands to devote to the dam and it rose the quicker.

The shape of the country behind it was such that when the Picket Wire flowed with sufficient volume to fill it, a long lake going back through the valley, or canyon, and twisting among the hills for some miles would result. In other words, the dam would make a beautiful artificial sheet of water bordered on one side by a high range of hills, on the other by the dam, and on the third by the hills and the low hogback above Spanish mesa, which separated the Picket Wire valley from the Kicking Horse gorge up which the railroad ran.

Buried in his own thoughts, communing with himself, considering ceaselessly his position, dreaming of the woman he loved, planning a new career, Meade yet explored every foot of the valley and ravine. He climbed to the top of Spanish mesa, and from its height the whole country clear up the valley to the main range was visible to him. He could look down into the deep ravine of the Kicking Horse, and note the marvelous beauty and airiness of the arch bridge for all it so solidly carried the heavy freight trains of the railway.

He could see far up and around the crooked course of the Picket Wire. The big grass-covered, but otherwise bare and treeless hogback, that ran from the upper end of the stone island of the mesa was equally visible to him. As it was the low tide of the new reservoir, he descended to it and studied it carefully. On another occasion, having said nothing to anyone about his excursion, he took advantage of a holiday to go out and inspect the hogback and ascertain its elevation with relation to the dam. Of course the engineers who planned the great irrigation works had done that, but he wanted to do it for himself. At one place, where the distance between what might be called the edge of the valley and the head of the ravine was narrowest—indeed, he estimated after pacing it that it measured not over twenty feet across—he discovered that the rounded earth crest was slightly lower than the intended level of the top of the dam.

When he returned to the office, he found on examining the construction drawings that an earth dike was planned to run along the hogback so that the top level should be higher than that of the dam. This dike would be only a hundred and fifty feet long and a few feet high, and could be built in a few days' time. Work on the main dam being more important, nothing had as yet been done on the dike.

Meade had been promoted toward the end of the fall and in a rather unusual way. One of the transit men, a young engineer, got a better job and left his instrument. Vandeventer called Meade before him.

"Roberts," he said, "there's a vacancy for a transit man. You've done such good work so far and shown such familiarity with fieldwork, that I'd give it to you if I had any idea that you knew anything about handling instruments."

"I think I may be trusted with one, sir," answered Meade, his eyes brightening.

"Yes, perhaps; but I have watched you in odd hours. The young men around here are constantly practicing with the transits. I've never seen you put a hand to one. How about it?"

"I'm not exactly a youngster, Mr. Vandeventer," returned Meade, "and I really didn't think it necessary to practice, but if you trust me with one I believe I can manage it."

Old Vandeventer leaned back in his chair in the office and looked carelessly away from Meade to all appearances. He clasped his hands back of his head and seemed lost in thought. Suddenly he began humming a little scrap of verse about another college which Cambridge men sing with zest:

> I'm a physical wreck,
> From the grand old Tech',
> But a h— of an engineer!

He stopped abruptly, whirled about in his swingchair, and shot a quick glance at Meade. It was a trap. And as he sprang it Vandeventer surprised the ghost of a smile, repressed quickly but there, on Meade's lips. The chief engineer was satisfied. Before this, little things had betrayed a fellow alumnus, or at least a fellow student of the old Lawrence Scientific school. Vandeventer was pleased at his adroitness. He did not, however, refer to it.

"There's a new transit in that box on the floor there," he said, resuming his indifferent manner. "I've had the case opened, but I haven't taken it out. Get it, and we'll go outside and see what you can do with it."

Now a transit, for all it is used in rough fieldwork, is one of the most expensive and delicate of instruments. It is capable of the most accurate adjustment, and if it is to be of any real use, the refinement of these adjustments must not be impaired in any degree by unskilled and reckless packing. The boxes in which the instruments are shipped are very carefully constructed in accordance with the principles which experience has shown to be necessary, and each one is especially fitted to the particular instrument to be contained therein. The box is a complicated thing and the transit cannot be taken out or replaced except in one way. With a knowledge of the combination, so to speak, it is comparatively simple to take a transit from the box; without that knowledge, which none but an expert transitman, or the packer himself can have, it is rather difficult without running a risk of ruining the instrument.

This command was another of Vandeventer's tests, therefore. Meade knew this as well as his superior. In spite of himself, he would have to betray his familiarity. Well, he had brought himself to the conclusion that he could not continue his work without very soon disclosing the fact that he had been an engineer. And in case of the inevitable, the sooner the better. So long as he had to betray himself, he would have all the advantages as well as the disadvantages. He unlocked the door of the box, slid the instrument out quickly, accurately, without a moment's hesitation, and rapidly unscrewed the head from the slide-board, and screwed it carefully on the tripod. Vandeventer's eyes sparkled.

"Come outside," he said, leading the way to the side of the hill, "and set it up there over the tack in that stake and level it."

Beginners have been known to take ten minutes to get a transit set up, leveled and centered. It is good work if it is done inside of a minute; thirty seconds is very fast. In forty-five seconds Meade reported, "all ready, sir." He could have done it in less, but he was a little out of practice, he said to himself.

"Look here," said Vandeventer, "you can't pull any more bluff on me, Roberts; you're an engineer, all right."

"I know something about the practical side of it, sir," answered Meade, turning a little pale and wondering how far Vandeventer would press his questions and what he would learn.

But the engineer was a man.

"Practical, yes, and theoretical too, I'll be bound, but I don't seek to pry into your antecedents. It's enough for me if you do good work for me here."

"I'll do my best, sir."

"Good; the instrument is yours."

That was the first step and the next step came very shortly after, when, having further demonstrated his capacity in other ways, Meade was given charge of the work on the east end of the dam.

"I don't care who he is," said Vandeventer to his chief subordinate, "he knows what he's about, and if you watch him you'll see. He's keen on handling men. The other section foremen will be hard put to keep up with him. He keeps watch on himself. He's got some secret he won't betray. He doesn't mingle with the crowd, but every once in a while something slips out. What he doesn't know about engineering nobody needs to know, I'll wager."

"How do you account for his being out here?"

"Oh, it's the old story, I suppose; he's come a cropper somewhere—down and out and wants to begin again, and can't do anything but this. It's not our business, Stafford; he does good work for us and we're satisfied."

CHAPTER XIV.

The Former and the Latter Rain.

The work on the dam was progressing splendidly. Vandeventer, driving his men hard, shared in all their furious efforts. He was not only their leader, but their inspiration. He had surrounded himself with a body of able assistants, and his teamsters and workmen had been culled until they had become a small army of picked men of which to be proud.

Among all these Meade stood very high. In the four months he had been with Vandeventer he had shown such a grasp of things, such an ability to handle men, in one or two instances when, with intention to try him, the resident engineer had given him

He Had Accompanied the Younger Man on One of His Rambles.

charge of some special work, that Vandeventer unconsciously looked to him in any emergency. He actually found himself consulting Meade on occasion.

He had accompanied the younger man on one of those rambles which he had hitherto taken alone. He had not broken down Meade's reserve, but he had won his admiration and regard. Vandeventer was not unknown in engineering circles. In earthwork he was by way of being an authority. His experience had been varied and extensive. Meade's reserve and reticence rather hurt the older engineer. He had invited confidence and had even given his affection. He intimated delicately that if the other were under a cloud Vandeventer might be in a position to help him.

It was fortunate for Meade's purpose of concealment, for his incognito, that most of his engineering work had been done abroad and that he had been out of touch with American engineering for practically the whole of his career. Vandeventer was a Harvard man, too, and that made it especially hard for Meade to keep from betraying himself. As a matter of fact, the younger man actually longed to make a clean breast of it, but he could not quite bring himself to do it yet. That might come later.

Three months ought to see the completion of the dam and the long canal, which was to carry the stored water to the irrigation ditches below. Vandeventer was already making plans for another big job, and he had decided, in his own mind, that among the subordinates whom he would take with him the newcomer should have the first chance. Vandeventer felt proud and satisfied when he surveyed the work that had been accomplished in the six months of labor. To be sure the delay in the completion of the spillway disquieted him a little.

The dam had reached the spillway level a fortnight before, and had now passed it. Indeed, on the fifth of January the dam builders were within five feet of the top; that is, the crest of the dam was 120 feet above the level of the valley. They had planned to run the spillway around the eastern end of the dam. The rock drills and dynamite which had been ordered had finally arrived in December, and by putting as many as possible to work on the spillway Vandeventer had succeeded in opening it for its entire width to an average depth of about seven feet below the intended top of the dam; that is, it was now about two feet deeper than the actual crest of the dam, but it still lacked five feet of its designed depth.

The rainy season, an inspection of the records had shown, was not due for a month and a half yet. That would give him ample time to complete the dam and the spillway. This year, however, there had been some very unusual rains during the fall and the water back of the dam was now 98 feet deep, which made it 22 feet below the level to which the dam had risen and 20 feet below the spillway. This was much more water than anyone had dreamed would be in the reservoir at that time, and was perhaps more than should have been allowed. Still there was a safety margin of 22 feet, which Vandeventer was sure would be ample. The financial promoters of the project were very anxious to have the reservoir full when the irrigating season opened, and the engineer's judgment had been influenced by their eagerness to get it working.

The broad sheet of water ran back into the valley for many miles. In fact, the dam had transformed the country into a beautiful lake. Sometimes it rained in the mountains when it did not rain down in the valley, and there was a constant, if very small, rise in the level. Vandeventer personally carefully gauged the water every day. Naturally he had noted that it rose gradually, but as the dam rose proportionately more rapidly, he was not uneasy. Yet, as a good engineer, he was watchful and largely because of the unfinished spillway he urged the men to the very limit.

The weatherwise from the town, who sometimes rode up to inspect the work, assured Vandeventer that it could not possibly rain before March, and the mere fact that so much water had fallen rendered it more improbable that any more would come down. But at three on the afternoon of January sixth it suddenly began to rain hard without warning and with no premonition on the part of anybody. It was not one of those terrible downpours known as cloudbursts, but it was an excessively hard, steady rain. The heavens over the range were black with clouds and so far as anyone at the dam could see, it was raining from the crest of the mountains down. There were some anxious discussions in the dining room of the resident engineer and his American assistants.

At four o'clock it was decided to open the undersluice gate about halfway, but when this was done the volume of water it was capable of discharging was too small to help very much, and on opening it to its fullest extent the velocity of the water rushing through was so great that the river bed was rapidly scoured out. For fear of undermining the toe of the dam it was necessary partially to close the sluice once more.

The water was rising, first at the rate of three or four inches an hour, then half a foot, and finally nearly a foot. By six o'clock that night it had risen two feet. It was still raining hard at that hour, although not quite so furiously as it had been. If it did rain until morning at the present rate, there would still be a margin of safety of perhaps fourteen or fifteen feet at dawn. Although the situation required watchfulness and was somewhat alarming, it was not desperate. The men were advised to put in all the time in their bunks so as to be good and ready for the hard battle which might come in the morning, and as they were all tired out with their day's work the little group soon broke up and each man went to his quarters.

Vandeventer, however, could not sleep. The rain kept up steadily all night. The resident engineer finally got up and dressed himself, and protected by high rubber boots and a cowboy slicker and a sou'wester, left his quarters and went out to inspect the dam. He carried a lantern, of course, for it was pitch dark and, if possible, the rain dropping from the black sky made it more difficult to see.

He was surprised when he got to the dam to see on the other side another lantern. Closing the slide of his own lantern to prevent observation, and being on familiar ground, he went straight toward the other side. The noise of the rain subdued any sound that he made, and he was able to come quite close to the other light without being noticed.

How young Roberts, the mysterious engineer, uses his talents and knowledge to good advantage is told in the next installment—he gets the opportunity to wipe out all disgrace, real or fancied.

(TO BE CONTINUED.)

Alexandria.

There are few cities that can look back to a past like that of Alexandria, and fewer still with such a past that can contrive to keep up with the times and look forward to the future. The relics of 25 dead centuries of Alexandrian history have to be looked for in the guide books. In the city itself they are covered up by the latest modern improvements. A few erudite Alexandrians may argue about the real nationality of Cleopatra, but most of them are talking about the price of cotton and the latest project for dredging the harbor.

Wanted Joy Distributed.

Marion was given a beautiful ring Christmas eve. She was overjoyed, but changed it from one finger to the other all evening. No one noticed it that evening, but she kept it up the next morning. Her mother, fearing Marion would lose the ring, said: "Why don't you put your ring on one finger and keep it there, Marion?" "Well, I don't like to be mean. When I keep it on one finger I pity the others."