

Chapman Allen

# **The Radio Boys at Ocean Point: or, The Message that Saved the Ship**



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«Public Domain»

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## **The Radio Boys at Ocean Point Or The Message that Saved the Ship**

### **FOREWORD**

**By Jack Binns**

In these days of Radio broadcasting, when the country has gone wild over wireless music and entertainment, there is a tendency to overlook the other phases of radio – such as its use as a means of saving life at sea, and for navigational purposes generally. There is no doubt about the interesting character of broadcasting, and equally, there is no doubt about the importance of radio as a means of life saving.

With this thought in mind, I think that the present volume, detailing the adventures of the Radio Boys, serves a very useful purpose in that it forcibly portrays the use of wireless to bring aid to a disabled ship on the high seas in a storm.

By doing this it will inculcate a desire among boys to learn the wireless code and transmit wireless telegraphy messages themselves, and in doing so will tend to develop that nucleus of communication experts in the coming generation, which is always an imperative necessity to every nation.

## CHAPTER I – TAKEN UNAWARES

“Jiminy, but this is hot work!” exclaimed Bob Layton, as he laid down the hammer he was using and wiped his perspiring forehead.

“Hot is right,” agreed his friend, Joe Atwood, as he also took a moment’s breathing space. “You might almost think it was August instead of early June. Old Sol must have got mixed up in his calendar.”

“I’d call it a day and knock off right now if we were doing anything else,” remarked Bob. “But, somehow, when I get going on this radio business I can’t seem to quit. There’s something about this wireless that grips a fellow. Work seems like play.”

“Same here,” said Joe. “I guess we’re thirty-third degree radio fans all right. I find myself talking radio, thinking radio, dreaming radio. If there was any such thing as radio breakfast food I’d be eating it.”

“I’m afraid we’ll get thin if we wait for that,” laughed Bob, picking up his hammer and resuming work on the aerial that they were stringing on the top of his father’s barn. “But come along now, old scout, and get a hustle on. We’re going to finish this job to-day if it takes a leg.”

Joe stretched himself lazily.

“I hope it won’t come to that,” he replied. “I need both legs in my business.”

“Well, come along and shake a leg anyway,” counseled Bob. “I’m not asking you to lose one.”

“I’m glad we decided to make this aerial in umbrella shape,” remarked Joe, as, following his friend’s example, he set busily to work. “I think it has it all over the vertical one. We’ll be able to hear the messages from the broadcasting station a heap better than we ever did before.”

“I’m sure we shall,” returned Bob. “That’s the kind Doctor Dale is using on his set, and he tried both the vertical and the flat-top kind before he finally settled on this. It’s better for long-wave work. It stands to reason that since it has the greatest surface area it also has the greatest capacity. Then, too, the end of the antenna that has the greatest potential is nearest the ground. The doctor gave me a lot of dope about it that sounded reasonable. He knows by actual experience, and that’s better than all the theory in the world.”

“What Doctor Dale says goes with me all right,” replied Joe. “He’s never been wrong yet in any of the tips he’s given us. It’s funny, isn’t it,” he continued, as he deftly drove a nail, “that we’re never satisfied with what we’ve got in this radio work? That first set we put together looked pretty good to us at the time. Then the ones with which we won the Ferberton prizes looked a good deal better yet. But now here we are making it still better.”

“That’s the beauty of radio,” said Bob, with enthusiasm. “The surface of it hasn’t been more than scratched so far. It’s practically a brand new thing with a million features to be explored and countless improvements to be made. I suppose a few years from now we’ll be laughing at the instruments we’re using now. They’ll seem as old fashioned as the stage coach and the kerosene lamp. Some of the best brains in the world are working at it now, and there’s hardly a day that you don’t hear of something new in connection with it. It keeps you guessing all the time as to what will turn up next.”

“Right you are,” agreed Joe. “Did you read the other day about that man in Paris who runs his house by radio? You know they have a powerful radio outfit on the Eiffel Tower. That starts operations at six o’clock every morning. This fellow has rigged up things all over his house that are controlled by the waves that come from the tower. First the shutters fly open, then the curtains are drawn back, then electric heaters get into action and begin to make the coffee – ”

“Say,” interrupted Bob, turning to look at his friend, “what are you giving me? Trying to get me on a string?”

“Honest to goodness, I’m not trying to kid you,” replied Joe. “This is straight goods. The coffee begins to bubble in the percolator, the breakfast is started cooking, and the people are waked up by electric bells placed alongside their beds. If the weather is hot, the electric fans are started working.”

“Does it wash and dress the baby, too?” demanded Bob, with a laugh.

“I don’t know whether they’ve got as far as that yet,” replied Joe, with a grin; “but it starts a lullaby at night and sings the baby to sleep. It sure does wonders. There seems to be no limit to what it can be made to do.”

“We’ll have to tell Jimmy about that,” chuckled Bob. “Anything that will save work will make a hit with him. He’ll want to hitch it up so that it will saw wood for him and mow the front lawn. By the way, Joe, when did Jimmy say he’d be around? He promised to help us out with this.”

“He said he wouldn’t be able to get here before three,” replied Joe. “He had to go on an errand for his father. But to-day’s baking day at his house, and I smelled doughnuts cooking as I came past. Ten to one he’s filling up on those. That beats working on a roof in a hot sun.”

“I shouldn’t wonder if you were more than half right,” agreed Bob. “But what’s keeping Herb? He promised to help out on the job.”

“There’s company at his house,” explained Joe. “But he said he’d slip away as soon as he could and get over here.”

“Sounds mighty uncertain,” said Bob. “Looks like a case of doing it ourselves if we want it done. And it’s got to be done this afternoon. They’ve got a dandy program on at the broadcasting station to-night, and I don’t want to miss it.”

The two boys set to work with redoubled energy, despite the sweat that rolled down their faces and made them have frequent recourse to their handkerchiefs.

“What’s the idea of all those rocks down at the side of the barn, Bob?” inquired Joe, at the moment that his work brought him close to the edge of the roof.

“They’re for some repairing that dad’s going to do to the barn,” replied Bob. “The side of it has settled some, and he’s going to put in a new stone foundation. The old shebang needs a lot of fixing, anyway. The water pipes are rusty, and they’ll have to be replaced. He wants to get the place in shape before we go down to Ocean Point for the summer.”

“Ocean Point!” repeated Joe, with a sigh. “Why do you want to bring that up now when I’m dripping with sweat? It’s cruelty to animals. Say, Bob, what would you give just at this minute to be taking a dip in the briny? Just imagine yourself at the end of the pier with your hands above your head, ready to dive down into that cool green water, down, down, down, and feel it closing all around you and – ”

“Who’s cruel now?” groaned Bob. “Stop right where you are or I’ll throw something at you. Don’t you suppose I’m just as crazy as you to get down there? It’s only last night that I dreamed I was there. Oh, boy! The swimming, the fishing, the boating, the games on the sand, the – ”

“Radio,” suggested Joe.

“Righto!” agreed Bob. “That will be a new thing there that we’ve never had before. And instead of being in a hot, stuffy room, we can sit on the veranda, with the sea breeze blowing all around us, and the ocean stretched before us in the moonlight, and the lights of ships passing up and down the coast and – ”

“Back up,” laughed Joe. “You’re getting poetical. You could almost set that to music. But you’re dead right that it will be just what the doctor ordered to listen to a radio concert under such conditions. Where can we put up our radio set? In your cottage or mine, I suppose.”

“I’ve got an idea it would be a good thing to put it up in the community hall,” replied Bob. “Then everybody could enjoy it, and there’s a broader and bigger piazza there than any of the cottages have. We’re all like one big family there anyway.”

“That’s a dandy plan,” agreed Joe. “I shouldn’t wonder, too, if we caught a good many messages from ships while we are down there. Almost all the vessels now are equipped with wireless, and we ought to be able to listen in on lots of talk going on with the shore.”

“I only wish we could talk back to them,” said Bob. “I’m keen for the time when we can send messages, as well as listen in on them. But that will be possible, too, before the end of the summer. I’m studying up hard on the code and I know you are too, and we ought to be able to pass our examinations soon and get the right to have a sending station. But look who’s going down the street, Joe!” he exclaimed, interrupting himself suddenly.

Joe followed the direction of his glance and gave a grunt of disgust.

“Buck Looker and his bunch,” he remarked contemptuously. “Carl Lutz and Terry Mooney always trailing along with him! I wonder what low-down thing they’re cooking up now.”

“No knowing,” replied Bob carelessly. “They’ve steered pretty clear of us since we got back that set of Jimmy’s that they took. I have to laugh whenever I think of them rolling over and over in the dark and fighting each other when they thought they were fighting us.”

Joe laughed too at the recollection.

“We put one over on them then all right,” he agreed. “And I have to laugh, too, when I think how he crawled yesterday when you called him down in the school yard while he was bullying little Sam Ashton.”

“I didn’t want to soil my hands with him,” returned Bob. “I’d made up my mind never to speak to him again. But it made my blood boil when I saw the way he was tormenting a boy half his size and I had to interfere.”

“It did me good to see how he backed down,” chuckled Joe. “I really hoped he wouldn’t, for I wanted to see him get a good trimming. But Buck’s memory is good, and I guess he remembered the thrashing you handed him the night he was trying to wreck your aerial.”

“Perhaps,” laughed Bob. “I sure was sore at him that night and I guess I gave him good and plenty.”

“The pity of it was,” said Joe, “that nobody was around to see you do it. Ten to one he told his cronies afterward that it was he who licked you. But there was no mistake yesterday. Lutz and Mooney were standing close by and saw him take water. He turned fairly green with fright when he saw you double up your fists. You want to keep your eyes open, Bob, for he’ll try to get even by doing you a dirty trick whenever he thinks he can get away with it safely.”

“Let him try,” replied Bob indifferently. “That’s the least of my worries. What’s bothering me a good deal more now is why Jimmy and Herb haven’t turned up to help us out on this job.”

“Guess they’ve got stalled somewhere,” hazarded Joe. “But even if they don’t turn up we’ll be done in half an hour or so. Then it’s me for a cold bath and some dry clothes! I’m drenched to the skin.”

A half hour later there was no sign of the truants, but the job was done, and Bob and Joe ran their eyes over it with keen satisfaction.

“Some little mechanics, old scout!” chuckled Bob, slapping his friend on the shoulder. “Now for that cold bath you were – ”

He stopped suddenly and gave vent to an exclamation of surprise.

“What’s the matter?” queried Joe, who was adjusting his belt.

“The ladder!” exclaimed Bob. “It’s gone!”

Joe looked toward the edge of the roof, and saw that the top of the ladder by which they had mounted was no longer in sight.

“It must have fallen down,” he said; “but it’s queer we didn’t hear it.”

“Fallen nothing!” snorted Bob, as he crawled to the edge of the roof and looked over. “It was resting solidly against the roof when we left it, for I shook it with my hand to make sure. Somebody has taken it down. There it is lying on the ground, twenty feet away from the barn.”



“Now we’re in a nice fix!” exclaimed Joe, in dismay. “Have we got to stay here all the afternoon and be baked to a frizzle by this scorching sun? Call to somebody in the house, Bob.”

“That’s the worst of it,” replied Bob lugubriously. “Mother’s out calling to-day and there isn’t a soul at home.”

The boys looked at each other, and the same thought came into the minds of both.

“Buck Looker!” they exclaimed in one voice.

“That’s who it was,” declared Bob savagely. “He and his gang have done this. If we could see him, it follows that he could see us, and he thought he’d keep us up here broiling while he had the laugh on us. No doubt the whole crowd are hiding somewhere and watching us at this minute.”

“Well, they’re not going to make a show of us,” Joe almost shouted in his wrath. “I’m going to get down off this roof and I’m going to get down quick, ladder or no ladder.”

Before Bob could stop him he had grasped the water pipe that ran alongside the barn and started to slide down.

“Don’t! Don’t!” cried Bob, in alarm. “The pipe’s rusty! It’ll break! For the love of Pete – ”

His voice ended almost in a scream.

For at that moment what he feared happened.

The pipe broke beneath Joe’s weight. The lad felt it going and grabbed frantically at the upper part that was still fastened to the roof. He caught it and held on, his legs dangling in the air directly over the pile of rocks more than twenty feet below. To fall on those rocks meant broken limbs or death!

## CHAPTER II – JUST IN TIME

At just the place in the pipe that Joe had grabbed there was a band running around it, perhaps a quarter of an inch thick. It was smooth and slippery, but yet gave more support to his clutching hands than would have been afforded by the pipe itself. To this precarious support poor Joe clung with desperation that was rapidly becoming despair as he felt his arms tiring and his hands slipping. A glance below had told him what awaited him if he fell on that pile of rocks.

Simultaneously with the breaking of the pipe Bob had flung himself at full length on the roof, with his arm extended over the edge. His feet felt around frantically and found a cleat in the roof in which he gripped his toes. Reaching as far as he could over the edge with one hand and holding on with the other, he found that he could just reach Joe's hands with his own.

If the roof had been flat, he might have been able by sheer strength to pull his friend up. But it was sloping, and, as he lay, his feet were considerably higher than his head. So he had no purchase, no way to brace himself and pull upward. As it was, he had to dig his toes tightly against the cleat just to sustain the weight of his own body.

There was imminent danger that if he even grasped Joe's hand the added weight would pull him over the edge of the roof. But this did not deter him for a second. He reached down and caught Joe around one of his wrists.

"I can't pull you up, Joe," he panted; "but I can hold on to you until help comes."

He lifted up his voice to shout for help, when just at that instant Herb Fennington and Jimmy Plummer turned the corner of the barn. They were talking and laughing gaily together, but stopped short with a cry of alarm as they saw the terrible plight of their friends.

"Quick! Quick!" cried Bob. "Get the ladder and put it up. Quick!"

There was no need of his frantic adjuration, for Jimmy and Herb understood instantly the tragedy that impended. They ran for the ladder, and with some difficulty, for it was long and heavy, put it up alongside the barn and close to Joe's swaying figure.

Then Herb, who was the stronger of the two, ran up the rungs until he was directly opposite his comrade.

"I'll hold on to one arm, Joe," cried Bob. "Let go the pipe with the other and give it to Herb."

Joe did as directed and the two boys swung him over to the ladder. He felt for the rung with his feet, and when they were firmly planted on it, Herb placed one of his hands on another rung and Bob followed suit. Then while Jimmy held the ladder at the foot to keep it from slipping, Joe and Herb made their way slowly to the ground and Bob came after.

They seated Joe on a box that stood nearby, and his comrades crowded around him; joyful beyond words at his narrow escape, clasping his hands and slapping him on the back.

Joe was gasping under the muscular and nervous strain that he had undergone in the few minutes that had seemed to him like ages, but he rallied gamely and tried to joke.

"I said I was going to get down off that roof quick," he said. "But I came mighty near coming down quicker than I wanted to. I can't thank you fellows enough."

And while they stand around him jubilating over his rescue, it may be well, for the benefit of those who have not read the preceding volume of this series, to tell who the Radio Boys were and what had been their adventures up to the time this story opens.

Bob Layton was a stalwart, vigorous youth of fifteen years, who lived in the thriving town of Clintonia, a city of about ten thousand population and located some seventy-five miles from New York City. His father was a prosperous druggist and chemist, esteemed and respected, and a leader in the civic life of the town. Bob was tall for his years, of dark complexion, with merry, flashing eyes. He was a leader in baseball, football, and the other athletic sports in which boys of his age delight. He was frank, truthful, courageous and a general favorite.

His special chum was Joe Atwood, son of a prominent doctor of Clintonia. Joe differed from Bob in being fair-skinned instead of dark. But the qualities of character of both boys were such as to make them close friends, and where one was to be found the other was seldom very far away. Joe, however, was impulsive, and his temper was of the “hair trigger” variety that required frequent curbing from his cooler-headed chum.

Of the many friends they had in town, the chief perhaps were Herbert Fennington and Jimmy Plummer. Herbert, or Herb, as he was usually called, was the son of a merchant, and was an easy-going, good-natured boy who was not especially fond of work, but who had an unusual liking for jokes and conundrums. He was slightly younger than Bob and Joe, but not enough to make much difference. Jimmy Plummer, the youngest of the four, was the son of a carpenter. He was jolly, fat, and round, with an appetite that made him the subject of good-natured jesting on the part of the other boys. He had been nicknamed “Doughnuts” because of his special fondness for that toothsome delicacy, and he did his best to live up to the name.

The boys were always much together, but of late their association had become still closer because of their common interest in the wonders of the wireless telephone. The marvelous features of this great invention had caught fast hold of their youthful imaginations, and they were soon so much absorbed in it that almost everything else was forgotten, or at least had to take second place.

Two things happened at almost the same time that increased their enthusiasm in this subject. One was a talk given to them on radio discoveries by Dr. Amory Dale, the pastor of the Old First Church of Clintonia, who had a scientific turn of mind and was most keenly interested in radio. The inspiration he gave them by his talk, together with practical object lessons on the making of radio sets, had an importance that could hardly be overestimated.

Shortly after this the member of Congress from the district in which Clintonia was included, Mr. Ferberton, offered prizes open for competition to all the boys of the district for the best radio sets made by the boys themselves. As the first prize was for a hundred dollars and the second for fifty, they were well worth trying for, and Bob, Joe, and Jimmy set to work in earnest to win one of them. Herb, owing to his natural indolence, did not enter into the competition, a circumstance that he afterward regretted.

They had a good many troubles and misadventures about this time, owing chiefly to the malice of Buck Looker, a bully of the town, who, together with his cronies, Carl Lutz and Terry Mooney, almost as bad as himself, did all they could to hinder the radio boys in their plans. Jimmy’s set was stolen by them on one occasion and on another Bob detected Buck trying to destroy his aerial at night, and gave the bully the trouncing that he richly deserved.

A curious accident that happened in the town opened to the boys a mystery that seemed difficult of solution and set their feet on the path of exciting adventures. How they rescued a girl whose automobile had run wild and dashed through the windows of a store, what they learned of her story and how they got on the track of a rascal who had swindled her, and what part the radio played in the unraveling of the plot, are narrated in the first book of this series, entitled: “The Radio Boys’ First Wireless; Or, Winning the Ferberton Prize.”

It did not take Joe long to recover from the shock he had had when he found himself suspended in midair over the rocks that had been gathered for the repairing of the foundation of the barn. Bob’s danger also had been great, and all felt that they had reason for being profoundly grateful over the happy outcome of the adventure.

“You just came in time, fellows,” said Bob. “Joe is no featherweight, and my arm was getting numb. A minute or two more and we’d both have had a tumble that I hate to think about.”

“That shows what good judgment we had in picking just the right time to come,” replied Jimmy, winking slyly at Herb. “It takes some brains to be Johnny-on-the-spot just when you’re needed. Not a minute too late, not a minute too soon – that’s my motto.”

"I'll admit that you took good care not to get here too soon," replied Bob, with a laugh. "Where have you been all the afternoon? Why did you leave Joe and me to hold the bag?"

"Look at his pockets and you'll find the answer," said Joe, pointing to suspicious bulges in Jimmy's jacket pockets.

"That's all the credit a fellow gets when he tries to be generous," complained Jimmy, in an aggrieved tone, as he emptied the pockets in question of half a dozen doughnuts. "Here I wait until the doughnuts are made so that I can bring along a lot for you fellows, and what do I get? Nothing but abuse. I was just crazy to help you fellows put up that aerial, but I sacrificed my own feelings and waited for the doughnuts so that you could have some."

"Those doughnuts were cooking three hours ago," retorted Joe.

"How do you know?" asked Jimmy.

"Because I smelled them as I came past your house," replied Joe.

"Oh, that was the first batch," explained Jimmy. "Most of those have gone by now."

"What became of them?" grinned Bob.

"How do I know?" countered Jimmy. "My father and mother have pretty good appetites. Then of course I sampled one or two. Mother would have thought I didn't like her cooking if I hadn't. And if there's anything I won't do it's to hurt my mother's feelings. We never have more than one mother, you know," he added virtuously.

"Sampled one or two!" sniffed Joe. "One or two dozen you mean."

"How did you fellows come to get in such a fix?" queried Herb. "Did the ladder fall down?"

"It did not," returned Bob with emphasis. "It was taken down while we weren't looking by somebody who wanted to play a trick on us. And I can come pretty near to guessing who did it, too," he added.

"Why not come right out with it?" said Joe, his face flushing with indignation. "It was Buck Looker and his gang who did it. I'm just as sure of it as though I had seen them. It's no thanks to them that I'm not dead or a cripple this minute."

"That explains something that Jimmy and I noticed just before we came up," said Herb eagerly. "We saw Buck and Lutz hot-footing it down one street and Terry Mooney down another. I thought they were having a race around the block or something like that."

"That just proves what I said," declared Joe. "They were waiting around to gloat over the hole they thought they had put us in. Then when they saw that one or both of us were going to be smashed on the rocks and perhaps killed, they got scared and lit out so as to be as far away as possible when the thing happened. Then they couldn't be suspected of being mixed up in it. It's all as clear as daylight, and it adds another tally to the score we have against those fellows."

"Oh, well, a yellow dog is a yellow dog, and he acts according to his nature," said Bob. "But now since you fellows are here, come up the ladder and take a look at the aerial and see what kind of job we've made of it."

Herb and Jimmy followed him up the ladder and were loud in their praises of the new contrivance.

"Couldn't have done it better myself," said Jimmy patronizingly. "I didn't worry about my not being here, for I had the fullest confidence in you and Joe. I knew you'd get it up all right."

He avoided the pass that Bob made at him, and after the boys had gathered up the tools and left everything shipshape, they came down the ladder and rejoined their comrade.

"I guess it's home for us now," said Herb.

"And mighty glad I am that none of us has to be carried home," put in Bob.

"You bet," remarked Joe, as he rose to go. "Do you remember what you said, Bob, about finishing that job if it took a leg? Well, it came pretty near to taking one – or two – or perhaps even worse than that."

## CHAPTER III – MARVELS OF RADIO

“Don’t forget now,” Bob reminded them, as his friends passed out of the gate on the way to their respective homes. “Be over at the house a little before eight, for the concert begins at eight o’clock sharp, and there aren’t many things in it that we want to miss. It’s the best program that I’ve seen for a month past. There’s violin music and band marches and opera selections and a bit of jazz mixed in.”

“Sounds as if it were going to be the cat’s whiskers,” said Jimmy.

“Jimmy, I’m ashamed of you,” said Bob, with mock severity. “When are you going to leave off using that horrible slang?”

“He might at least have said the ‘feline’s hirsute adornments,’” muttered Joe. “That would have been a little more dignified. But dignity and Jimmy parted company a long time ago.”

“I didn’t know they’d ever met,” remarked Herb. “But if they were ‘lovers once they’re strangers now.’”

“I shook it when I found that it wasn’t good to eat,” said the graceless Jimmy, nowise abashed. “But you fellows had better stop picking on me or it’ll be good-bye to any more doughnuts.”

They laughed and parted with another admonition by Bob to be on time. He himself went into the house and solaced himself with the cold bath and change of clothes that he had been promising himself all through that hot afternoon. A brisk rubdown with a rough towel did wonders, and by the time his mother returned he was feeling in as good shape as ever, with the exception of a touch of lameness in the right arm that had been subjected to such an unusual strain that day.

There were grave looks on the faces of both his parents as, at the supper table, he narrated the events of the afternoon. Mingled with their gratitude at his and Joe’s escape from injury, was a feeling of deep indignation against the probable authors of the trick.

“That Buck Looker is one of the worst if not the very worst boy in town!” ejaculated Mr. Layton. “There’s hardly a week goes by without hearing something mean or rowdyish with which he’s mixed up. He’s the kind of boy that criminals are made of after they grow up.”

“One might have overlooked the taking down of the ladder in itself,” commented Mrs. Layton; “but the contemptible part was in running away instead of running to help when he saw that the boys were in danger of being crippled or killed. He and his cronies could have got the ladder up in time, for they knew of the danger before Herb and Jimmy did. But he’d have let the boys be killed rather than take a chance of himself being blamed. That shows the stuff the boy is made of.”

“Pretty poor stuff, I’m afraid,” agreed Bob. “But, after all, Mother, here I am safe and sound, and all’s well that ends well.”

By a quarter to eight that evening the boys began to come, and even the tardy Jimmy was on hand before the time scheduled for the concert to begin. In addition to the pleasure they anticipated from the unusually fine program, they were keenly curious to learn what improvement, if any, had been made by the installation of the umbrella aerial.

They were not long left in doubt. From the very first tuning in there was an increase in the clearness and volume of the sound that surpassed all their expectations. The opening number chanced to be a violin solo, played by a master of the instrument. It represented a dance of the fairies and called for such rapid transitions up and down the scale as to form a veritable cascade of rippling notes, following each other with almost inconceivable swiftness. And yet so clearly was each note reproduced, so distinctly was each delicate shading of the melody indicated, that the player might have been in the next room or even in the same room behind a screen.

The boys and the others were delighted. They listened spellbound, and when in a glorious burst of what might have been angel music the selection ended, the lads clapped their hands in enthusiastic applause.

“That’s what you can call music!” ejaculated Bob.

“That player knows what he’s about,” was Herb’s tribute.

“And how perfectly we heard every note,” cried Joe. “We certainly made a ten strike, Bob, when we rigged up that new aerial. It’s got the other beaten twenty ways.”

“I guess you’re right about that,” said Jimmy. “I don’t grudge a minute of the time you spent this afternoon in putting it up. It was worth all the trouble.”

Bob looked hard at him, but Jimmy was as sober as a judge, and before either Bob or Joe could frame a suitable retort the crashing notes of a military band came to their ears and put from them the thought of anything else. It was a medley that the band played, composed of well-known airs ranging from “Hail Columbia” to “Dixie” and so inspiring was it that the boys’ hands were moving and their feet jiggling in time with the music all through the performance.

For fully two hours they sat entranced through a varied program that included things so dissimilar as famous grand opera selections, the plaintive melodies of Hawaiian guitars, and some jazz, and when at last the list was ended the boys sat back with a sigh of satisfaction, their faces flushed and their eyes shining.

“Ever hear anything like it?” asked Bob, as he relaxed into his chair and took off his ear pieces.

“It’s the best ever!” declared Joe. “And to think that we can have something like it almost any night we choose, and all of that without going out of this room!”

“That’s the beauty of it,” Bob assented. “To hear a concert that included such fine talent as that we’d have to go to New York. That would mean all the time and trouble of dressing up, the long ride on the railroad train, the getting back home at two or three o’clock in the morning, to say nothing of the ten dollars apiece or thereabouts that we’d have to pay for train fare and tickets for the concert. For us four that would mean about forty dollars. Now we haven’t paid forty cents, not even one cent, we haven’t had to dress, we’ve sat around here lazy and comfy, we can go to bed whenever we like, and we’ve had the concert just the same. And what we did to-night we can do any night. I tell you, fellows, we haven’t begun yet to realize what a wonderful thing this radio is. It’s simply a miracle.”

“Right you are,” agreed Joe. “And just remember that what’s true of us four is true of four thousand or perhaps four hundred thousand. Take the biggest concert hall in the United States and perhaps it will hold five thousand. When it’s full, everybody else has to stay away. But there’s no staying away with radio. And every one has as good a seat as any one else. Think where that concert’s been heard to-night. People out as far as Chicago and Detroit have heard it. They’ve listened to it on board of ships out at sea. In lonely farmhouses people have enjoyed it. Men sitting around campfires up in the Adirondacks have had receivers at their ears. Sick people and cripples lying on their beds have been cheered by it. Lonely people in hotel rooms far away from home have found pleasure in it. There’s absolutely no limit to what the radio can do. It seems to me that it throws in the shade everything else that’s ever been invented.”

“You haven’t put it a bit too strong,” chimed in Herb. “But talking about a lot of people hearing it makes me think that perhaps we fellows have been a bit selfish.”

“What do you mean?” asked Jimmy in some surprise. “It isn’t so long ago that we got the old folks and sick folks together and gave them a concert at Doctor Dale’s house – Joel Banks and Auntie Bixby and the rest of them.”

“I don’t mean that,” explained Herb. “That was all right as far as it went, and I hope we’ll do it soon again. But what I have in mind are our own folks and our friends. Our fathers and mothers haven’t heard much of this concert to-night, and there are some of the fellows that we might have invited in.”

“But we have only four sets of ear pieces,” objected Jimmy. “I suppose of course we could attach a few more – ”

“I get Herb’s idea,” interrupted Bob, “and it’s a good one. He thinks that we ought to have a loud-speaker – a horn that would fill the room with sound and do away with the ear pieces altogether.”

“You hit the bull’s-eye the first time,” Herb conceded. “In other words, instead of having a concert for four have it for fourteen or forty.”

## CHAPTER IV – FACING THE BULLY

The radio boys ruminated over Herb's suggestion for a little while.

"The idea itself is all right," pronounced Joe slowly, "but the trouble is that we couldn't do it very well with this set, which is the best we've been able to make so far. We can hear the sound that comes over the wire well with these earpieces glued to our ears, but the sound would be lost if it were spread all over the room."

"Wouldn't the horn help out on that?" asked Herb.

"Not by itself, it wouldn't," answered Bob. "It's a mistake to think that the horn itself makes the sound or increases its loudness. The only use of the horn is to act as a relay for the diaphragm of the receiver and connect it with the air in the room. But the sound itself must first be in the receiver. And with a crystal detector, such as we're using in this set, I'm afraid that we couldn't get volume of sound enough. It would be spread out over the room so thinly that no one would be able to hear anything. We'll have to amplify the sound, and to do that there's nothing better than a vacuum tube. That's the best thing that the world has discovered so far."

"I guess it is," remarked Jimmy. "Doctor Dale has one in his set."

"Yes," chimed in Joe. "He even has more than one. The more there are the louder and clearer the sound."

"I don't suppose we could make one," Herb remarked.

"No; that's one thing that costs real money," replied Bob. "But don't let that bother you. I've got quite a lot left of that hundred dollars of the Ferberton prize, and there's nothing I'd rather spend it for than to improve the radio set."

"Count me in on that, too," said Joe. "I've scarcely touched my fifty."

"How about the horn?" queried Jimmy. "Will that have to be bought, too?"

"No," replied Bob. "That's something you can make. That is, if you're not too tired from the work you did on setting up the aerial this afternoon."

"But," objected Jimmy, ignoring the gibe, "I don't know anything about working in tin or steel. I haven't any tools for that."

"The horn doesn't have to be made of metal," answered Bob. "In fact, it's better if it's not. Some horns are even made of concrete –"

"Use your head for that, Jimmy," broke in Herb irreverently.

"But best of all," Bob continued, while Jimmy favored the interrupter with a glare, "is to make the horn of wood. Take some good hard wood, like mahogany or maple, polish the inside with sandpaper after you've hollowed it out, give it a coat of varnish or shellac, and you'll have a horn that can't be beaten. It's very simple."

"Sure!" said Jimmy sarcastically. "Very simple! Just like that! Simple when you say it quick. Simple as the fellow that tells me how to do it."

"Just imagine you're hollowing out a doughnut," put in Joe, grinning. "You're an expert at that."

"I'll tell the world he is," agreed Herb, with enthusiasm.

"That reminds me," said Bob, "that there's some pie in the pantry and sarsaparilla in the ice-box that mother told me to pass around among you fellows. That is, of course, if you care for it," he added, as he paused in seeming doubt.

"If we care for it!" cried Jimmy, the creases of perplexity in his brow disappearing as if by magic. "Lead me to that pie. I'll fall on its neck like a long-lost brother."

"It'll fall into your neck, you mean," chuckled Herb, and in less than two minutes saw his prophecy verified.

“And now,” said Bob, after the last crumb and drop had disappeared, “I don’t want to tie the can to you fellows, but I hear dad moving around and locking up, and that’s a sign to skiddoo. We’ll think over that idea of Herb’s and get a tip from Doctor Dale as to the best way to go about it.”

There was a chorus of hearty good-nights and the radio boys separated.

Two days later, as Bob and Joe were coming home from school, the latter, looking behind him, gave vent to an exclamation that drew Bob’s attention.

“What’s up?” he asked, turning his head in the same direction.

“It’s Buck Looker and his bunch!” exclaimed Joe, a flush mounting to his brow and his eyes beginning to flame. “He’s been careful to keep out of my way so far. Let’s wait here until he catches up to us.”

“You’ll wait a long time then, I guess,” replied Bob, “for he’s seen us, too, and he’s slowing up already. He doesn’t seem a bit anxious to overtake us.”

“Then we’ll have to go back and meet him,” said Joe grimly. “I’m going to have it out with him right here and now. He needn’t think he’s going to get away scot free after the trick he played on me.”

“What’s the use, Joe?” counseled Bob. “You can’t prove it on him and he’ll only lie out of it. It’s bad policy to kick a skunk.”

But Joe had already turned and was striding rapidly back toward Buck and his companions, and Bob went along with him.

There was a hurried confabulation between Buck and his cronies as they saw Bob and Joe advancing toward them, and a hasty looking from side to side, as though to seek some means of escape. But there was no street handy to turn into, and as it would have been too rank a confession of cowardice to turn their backs and run, the trio assumed a defiant attitude and waited the approach of the swiftly moving couple.

Joe stopped directly in front of the bully, while Bob ranged alongside, keeping a sharp watch on the movements of Lutz and Mooney.

“Why did you take down that ladder the other afternoon, Buck Looker?” asked Joe, looking his opponent straight in the eye.

Buck’s look shifted before Joe’s gaze, but he affected ignorance.

“What ladder and what afternoon?” he countered, sparring for time. “I don’t know what you’re talking about, and for that matter I guess you don’t either.”

“I know perfectly well what I’m talking about, and so do you,” replied Joe, coming so near to him that Buck gave ground. “You and your gang took away the ladder from the side of Bob’s barn, and in trying to get down I nearly broke my neck.”

“Pity you didn’t,” blustered Buck. “If your ladder fell down and you didn’t have sense enough to wait for some one to come along and put it up for you, that wasn’t any fault of mine. I wasn’t anywhere near Layton’s barn that whole afternoon.”

“We know better,” said Joe. “Bob and I saw you going along the street a little while before we missed the ladder, and Herb Fennington and Jimmy Plummer saw you and your crowd running away like mad while I was hanging to the pipe alongside the barn.”

“You shut up!” yelled Buck, in a burst of rage.

“Take off your coat, Buck Looker,” cried Joe, dropping his books to the ground, “and I’ll give you the same kind of a trimming that Bob gave you the night you tried to wreck his aerial.”

For answer Buck tightened his grip on the strap that held his books.

“You stand back, Joe Atwood,” he cried, with a quaver in his voice, “or I’ll soak you with these books!”

Joe laughed his disdain.

“You coward!” he exclaimed, and was springing forward when a warning exclamation came from Bob.

“Stop, Joe,” he commanded. “Here comes Mr. Preston.”



A look of vexation came into Joe's eyes and a look of relief into Buck's as they looked and saw the principal of the high school walking rapidly toward them.

## CHAPTER V – A BIG ADVANCE

With the coming of the school principal and the certainty that the threatened row was over, for the present at least, all Buck Looker's usual truculence returned.

"It's lucky for you that Preston happened to turn up just now," he snarled. "I was just getting ready to give you the licking of your life."

"I noticed that," said Joe dryly, as he picked up his books. "Only instead of doing it with your fists, you were going to do it with your books, like the coward that you are. You gave yourself away that time, Buck. It isn't necessary for any one to show you up. You can be depended on to do that job yourself."

By this time the principal was only a few yards away, and Buck and his friends walked away rapidly, while Bob and Joe followed more slowly, so that Mr. Preston soon caught up with them.

"Good afternoon, boys," he said, as he came abreast of them. "You seemed to be a little excited about something."

"Yes, we were having a little argument," admitted Joe.

The principal looked at them sharply and waited as though he expected to hear more. But as nothing further was said, he did not press the matter. If the trouble had taken place in the school or on the school premises, he would have felt it his duty to go to the bottom of the affair. But he had no jurisdiction here, and he was too wise a man to mix in things that did not directly concern him or his work.

"Well, how goes radio?" he asked, changing the subject. "Are you boys just as enthusiastic over it as you were the night you won the Ferberton prizes?"

"More so than ever," replied Bob, and Joe confirmed this with a nod of the head. "It's getting so that almost every minute we have out of school we're either tinkering with our set or listening in. We've just finished putting up a new umbrella aerial, and it's a dandy."

"I use that kind myself," said Mr. Preston. "I get better results with it than I do with anything else."

"Why, are you a radio enthusiast, too?" asked Bob, in some surprise. "I didn't have any idea you were interested in it."

"Oh, yes," affirmed the principal, with a smile. "I'm one of the great and constantly increasing army of radio fans. I understand there are more than a million of them in the United States now, and their ranks are being swelled by thousands with every day that passes. I use it for my own personal pleasure and for that of my family, but I also have an interest in it because of my profession."

"I understand it's becoming quite a feature in education," remarked Joe.

"It certainly is," replied Mr. Preston. "Many colleges and high schools now have radio classes as a regular part of their course. College professors give lectures that go by radio to thousands where formerly they were heard by scores. I've been thinking of a plan that might be of help in the geography classes, for instance. Suppose some great lecturer or traveler who has been in faraway lands should give a travel talk from some broadcasting station. Then while he was describing China, for instance, we might have moving pictures thrown on a screen in the classroom showing Chinese cities and customs and types. Both the eye and the ear would be taught at the same time, and in a most interesting way, it seems to me. What do you think of the idea?"

"Fine," said Bob.

"Dandy," agreed Joe. "There wouldn't be any lack of interest in those classes. The boys would be eager to have the time for them come."

"Well," smiled Mr. Preston, "it's only an idea as yet, but it's perfectly feasible and I shouldn't be surprised to see it in general use in a year or two."

He turned into a side street just then with a pleasant good-bye, and the boys went on their way together, picking up Jimmy, who was just emerging from a store.

“What was Mr. Preston talking to you about?” asked Jimmy, with some curiosity, for he had witnessed the parting. “Hauling you over the coals, was he, for something you’ve done or haven’t done?”

“Nothing like that,” replied Joe. “We just found out that he is a radio fan like the rest of us.”

“Funny, isn’t it, how that thing is spreading?” murmured Jimmy musingly. “You couldn’t throw a stone now without hitting somebody who is interested in radio.”

“All the same, I wish he hadn’t caught up to us when he did,” grumbled Joe. “I was just going to mix it with Buck Looker when he came along.”

“Buck has lots of luck,” commented Jimmy. “Tell me all about it.”

They told him all the details of the meeting, and became so engrossed in it that they almost ran into Dr. Dale, who was just coming up from the railroad station.

He greeted them with great cordiality, which met with quite as hearty a response on their part, for the minister was a prime favorite with them and they always felt at their ease with him. There was nothing prim or professional about him, and his influence among the young people was unbounded.

He chatted with them for a few minutes until they reached Bob’s gate.

“Won’t you come up on the porch for a few minutes, Doctor?” asked Bob. “There are some things we’d like to ask you about radio.”

“Certainly I will,” replied the doctor, with a smile. “There’s not much that I’d rather talk about. In fact, I was just about to tell you of an interesting experience that I had this very afternoon.”

He went with the boys up the steps and dropped into the chair that Bob drew up for him.

“Tell us about that first, Doctor,” urged Bob. “Our questions can come afterward.”

“I just had the luck to get on a train coming home that had a car attached to it where they were trying out a new radio system,” replied the minister. “I heard about it from the conductor, whom I know very well, and he arranged it so that I could go into the car where they were making the experiments. They had a radio set in there with a horn, and the set was connected with an aerial on the roof of the car. They sent out signals to various stations while the train was going along at the rate of forty miles an hour, and got replies that we could hear as plainly as though one of the people in the car were talking to the others. The whole thing was a complete success, and one of the officials of the road who happened to be in the party told me that the express trains on the road were going to be equipped with it.

“Of course, if one road does that, it will not be any time before all the others will, too. It’ll not be long before we can be sitting in a car traveling, let us say from New York to Albany, and chat with a friend who may be on another train traveling between Chicago and Denver. Or if a business man has started from New York to Chicago and happens to remember something important in his office he can call up his manager and give him directions just the same as though he pressed a buzzer and called him in from the next room.”

“It sounds like magic,” remarked Bob, drawing a long breath.

“If we’d even talked about such things a few hundred years ago we’d have been burned at the stake as wizards,” laughed the doctor.

“The most important thing about this railroad development,” he went on, “is not the convenience it may be in social and business life, but in the prevention of accidents. As it is now, after a train leaves a station it can’t get any orders or information until it gets to the next station. A train may be coming toward it head on, or another train ahead of it and going in the same direction may be stalled. Often in the first case orders have come to the station agent to hold a train until another one has passed. But the station agent gets the message just a minute too late, and the train has already left the station and is rushing on to its fate. Then all the agent can do is to shudder and wait for news of the crash. With the radio equipment he can call up the train, tell of the danger, and direct it to come back.

“Or take the second case where a train is stopped by some accident and knows that another train is coming behind it on the same track and is due in a few minutes. All they can do now is to send back a man with a red flag to stop the second train. But it may be foggy or dark, and the engineer of the second train doesn’t see the flags and comes plunging on into the first train. With the radio, the instant a train is halted for any reason, it can send a message to the second train telling just where it is and warning of the danger. Hundreds have been killed and millions of dollars in property have been lost in the past just because of the old conditions. With the radio installed on trains, that sort of thing will be made almost impossible in the future.

“But there,” he said, with a smile, “I came up here to answer your questions, and I’ve been doing all the talking. Now just what is it you wanted to ask me about radio?”

## CHAPTER VI – THE WONDERFUL TUBE

“It’s about getting a vacuum tube,” replied Bob, in answer to the doctor’s question. “The crystal detector is all right when we use the ear pieces. But we got to thinking about a horn so that lots of people could enjoy the concerts at the same time, and we figured that the crystal wouldn’t be quite good enough for that.”

The doctor smiled genially.

“I knew you’d be wanting that sooner or later,” he said. “It’s the second natural step in radio development. While you were still getting familiar with the working of the wireless, the crystal would do very well. But there comes a time to all amateurs when they get to hankering after something that is undeniably better. And the vacuum tube is that thing.”

“It seems funny to me that the vacuum tube could have any use in radio,” put in Jimmy. “I never thought of it in any way but as being used for an electric light.”

“Neither did lots of other people,” replied the doctor, smiling. “Even Mr. Edison himself didn’t realize what its possibilities were. He did, though, discover some very curious things about it. In fact, he made the first step that led to its use for radio. He put a plate in one of his lamps. The plate didn’t touch the filament, but formed part of a circuit of its own with a current indicator attached. Then when he turned on the light and the filament began to glow, the needle of the indicator began to twitch. Since the filament and the plate weren’t touching, the movement of the needle indicated that the electricity must have jumped the gap between the two. But this simply showed that an invisible connection was established between the filament and the plate and nothing more came of it at the time.

“Now, it’s likely that even yet we shouldn’t have had that discovery of Edison’s used for the development of radio if it hadn’t been for the new theory of what electricity really is. That theory is that everything is electricity. This chair I’m sitting on, the railing to this porch, the hat that Jimmy is holding in his hand – all that is electricity.”

Jimmy gave a little jump at this, and held his hat rather gingerly at arm’s length and looked at it suspiciously.

The doctor joined in the laugh that followed.

“Oh, you needn’t be afraid that you’ll get a shock,” he said. “Electricity won’t hurt you as long as it’s at rest. It’s only when it gets stirred up that high jinks are apt to follow.”

Jimmy looked relieved.

“Now,” continued the doctor, “the theory is that all matter is composed of an infinite number of electrons. An electron is the smallest thing that can be conceived, smaller even than the atom which used to be thought of as the unit. There may be millions, billions, quadrillions of them in a thing as big as a hickory nut. And when these electrons get busy you can look out for things to happen.

“Every hot object sends out electrons. That’s the reason that the filament in the electric light tube sends them out.”

“I suppose a red-hot stove would send them out, too,” suggested Joe. “If that is so, I should think that people would have found out about them long ago.”

“Ah, but there’s this difference,” explained the doctor. “The red-hot stove does send them out, but the air stops them. Remember that the atoms of which the air is composed are so large that the poor little electrons have no chance against them. It’s like a baby pushing against a giant. It can’t get by.

“Now the vacuum tube comes along, knocks out the giant of the air, and lets the baby electrons pet past him. The air is pumped out of the tube and the electrons have nothing to stop them. That’s why Mr. Edison saw the needle on the plate begin to move, although the plate wasn’t touching the filament. The electrons jumped across the gap between the filament and the plate because there was nothing to stop them.

“With this discovery of Mr. Edison’s to aid him, a man named Fleming came along, who found that the oscillations caused by the flow of electrons to the plate could be utilized for the telephone by the use of what he called an oscillation valve that permitted the passage of the current in one direction only. That was the second important step.

“But these two steps alone wouldn’t have made radio what it is to-day if it hadn’t been for the wonderful improvement made by DeForest. He mounted a grid of wire between the filament and the plate connected with a battery. He found that the slightest change in the current to the grid made a wonderfully powerful increase in the current that passed from the filament to the plate. Just as when you touch the trigger of a rifle you have a loud explosion, so the grid magnifies tremendously the sound that would otherwise be weak or only ordinary. And by adding one vacuum valve to another the sound can be still further magnified until the crawling of a fly will sound like the tread of an elephant, until a mere whisper can become a crash of thunder, until the ticking of a watch will remind you of the din of a boiler factory, and the sighing of the wind through the trees on a summer night will be like the roar of Niagara.

“But there,” he broke off, with a little laugh, “I’m letting my enthusiasm carry me away. It’s hard to keep calm and cold-blooded when I get to talking about radio.”

“Well, you don’t care to talk about it more than we care to hear about it, you can be sure of that,” said Joe warmly.

“Yes,” chimed in Jimmy, “to me it’s more interesting than a – a pirate story,” he added rather lamely.

“With the advantage,” laughed Dr. Dale, “that the pirate story usually has lots of pain and misery in it for somebody, while the radio has nothing but benefit for everybody. Why, you can scarcely think of any experience in which the radio won’t help. Take an Arctic expedition for instance. It used to be that when a ship once disappeared in the ice floes of the Arctic regions it was lost to the world for years. Nobody knew whether the explorers were alive or dead, were failing or succeeding, were safe and snug on board their ship or were shipwrecked and freezing on some field of ice. Look at the Greeley expedition, when for months the men were freezing and starving to death. If they had had a radio outfit with them, they could have communicated with the outside world, told all about their plight, given the exact place they were in, and help would have gone to them at once. Not a man need have perished. So if a crew were shipwrecked on a desert island, they wouldn’t to-day have to depend on a flag or bonfire to catch the attention of some ship that might just happen to be passing near the island. All they would have to do would be to send out a radio message – provided, of course, they had one from the wrecked ship’s stores or had material to make one – and a dozen vessels would go hurrying toward them. Those naval balloonists that were lost in the wilds of Canada a couple of years ago, that other expedition that perished in the heart of Labrador, and similar cases that might be counted by the dozens – all could have been helped if they had been able to tell their troubles to the outside world. I tell you, boys, we haven’t half begun to realize what the discovery of radio means to the world.

“Now all this leads us back to vacuum tubes, for it’s only with them that all these things would be possible. Perhaps in the future something better yet will be invented, but they’re the best we have at present. I’m heartily in favor of you boys using a tube instead of a crystal, because it will give you vastly more enjoyment in your work. I wouldn’t have more than one at the start, but later on it may be well to have more. I have a catalogue up at my house of the various makes and prices, and if you’ll run up there any time I’ll give it to you. At the same time I’ll show you just how it’s got to be inserted and attached. Maybe also I’ll be able to help you in the making of the horn. I’ll have to go now,” he added, looking at his watch. “It’s surprising how the time flies when we get on this subject. Good-bye, boys, and don’t forget to drop in at the house whenever you can.”

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