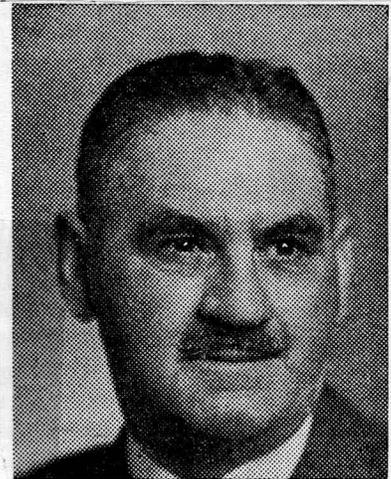


An Interview

with CHARLES S. COWAN

**FOREST PROTECTION
COMES UNDER THE MICROSCOPE**

By Elwood R. Maunder



Charles S. Cowan has been a leader in forest protection work in the Pacific Northwest for over forty years. He began his career in the British Columbia Forest Service before World War I, and retired last year as manager of the Washington Forest Protection Association. This interview, conducted by Elwood R. Maunder, Director of the Forest History Foundation, was tape-recorded in Seattle, Washington, October 30 and November 2, 1957. It is the record of a conversation as it occurred and should be read as such.

The editor regrets the lack of annotation, but has purposely omitted it in order to accommodate a greater portion of the interview. This selection comprises less than a third of the 55-page, indexed interview.

MAUNDER: *Charlie, We're just going to sit around the fire here tonight and talk about the history of fire control in the Pacific Northwest. The U.S. government inaugurated its ranger system in 1898. What was the public attitude toward the rangers?*

COWAN: Oh, of course, I don't know what it was in 1898, but I know that in 1909 and 1910, and onwards, there was a feeling of antagonism among the settlers. These men were preventing them from doing what they thought was a legitimate function of land clearing, and land clearing was accomplished largely with a box of matches. If the fire burned hard and went well, their land was burnt, and the fact that others, non-resident owners, had some property loss didn't enter the minds of the settlers of those days.

MAUNDER: *They thought that their burning was perfectly justified?*

COWAN: Oh, yes.

MAUNDER: *In other words, there was very little cooperation with the ranger and his police work?*

COWAN: No, there was very little cooperation with the ranger and his police work. He was a newcomer to the frontier. He came with a policy that was alien to the average settlers and he prevented them from doing those things which they desired to do—to accumulate sufficient cleared land that would allow for agriculture.

MAUNDER: *What about the local justices of the peace and juries? Did they cooperate at all in enforcing fire prevention laws, or was there a tendency to let the local offenders off?*

COWAN: The tendency was to let the local offenders off, because the local magistrate (which was the level at which any charges were levied as they were misdemeanors rather than criminal offenses) was one of the settlers, the leading settler perhaps, or the leading businessman. His idea, of course, was to develop agriculture. Remember that in those days agriculture was the primary pursuit of the American people; we were not the industrialized people of today.

MAUNDER: *What can you say about the history of the public's change of attitude toward regulation?*

COWAN: I think it largely came about with the running rampant of certain fires. For instance, here in Washington the Yacolt Fire of 1902 resulted in the burning to death of 16 people, and it meant an evolution in the thinking of the people because here it was not only property destroyed, it was a case where life was destroyed. The fact that two billion feet were burned up in that fire meant very little to the newspapers of the day, which again reflected the feeling of the people. The big fact was that 16 people lost their lives. Then fires became known as something that would endanger human life.

MAUNDER: *What cooperation has there been between Canadian and American forest services in preventing and fighting forest fires?*

COWAN: In the early '20s we had a great many fires that started in the United States and went into Canada, and contrariwise we had some fires that started in Canada and ran into the United States. The business of each one of them was to carefully herd the fire into the other fellow's territory, that is, let it go. If one knew the wind was blowing in that direction, and he knew that within an hour or two it would be on the other fellow no decisive action was likely to be taken. The fact that it increased in size made very little difference with the local attitude, nor with the attitude of the heads of the departments.

Around that time I had some correspondence with the District Forester at Portland and with the State Forester, Pape, in Olympia, and we managed to draw up an agreement whereby if any fire occurred within a mile of the boundary, the nearest officer in charge would take steps to suppress it, and as soon as possible a forest officer from either service would appear on the scene and would take over the payroll. And we all three signed that, that is, the District Forester at Portland, and the State Forester, then Mr. Pape, at Olympia, and myself for British Columbia.

And that continued; I'm not sure whether it is in existence today. However, it took some time to work out. I wasn't around to see its proper functioning, but I do know that in the very first year of its operation we stepped into a fire up in the Nelson District upon which we expended a sum of money, \$6,000, I think. In those days that was quite a sum of money to be expended over the boundary. We had to go to extremes to collect any of it and we wound up by making a compromise, after fighting fire solely on American soil. Naturally, we became a little bit sour at that type of cooperation, and when I expressed my feelings about it, the people in charge of the Weeks Law at that time—I think it was the Weeks Law—were very exercised and wanted the contract to continue. They came to our rescue and we made a little better compromise than was offered to us originally by the state. It worked out fairly well in the following years because no fire which was within a mile of either boundary on which either side took action amounted to very much, so that payment was made promptly.

MAUNDER: *Were the first fire wardens political appointees, or were they to a certain extent professional?*

COWAN: Of course, politics always entered into these matters to a certain degree, but, by and large, I think the state men were local woodsmen who had small farms and worked occasionally at the logging camps, the men who were largely engaged in developing small farms, and they went on patrol in the summer. It was a limited job, very limited in time. It

started originally, I believe, on May 15th and ended on September 15th regardless of the situation in the field.

MAUNDER: *Broadly, what were the responsibilities of the fire warden?*

COWAN: They were supposed to patrol and to put out fires where they could. It was a daily job through the fire season. And you've got to remember that our road system was in embryo at that time, settlements were fixed in small areas, and logging had not progressed off the valley floors; they weren't in the hills. We were logging with oxen and horses and the amount of slash that was created was not excessive, because only the finest logs were taken and there was always some forest cover. And when steam came in, actually the same system of selective logging was used, with the exception that instead of having oxen and skid roads we had steam power on the skid road because the first steam machines were putting in over skid roads.

MAUNDER: *Well, going back to these fire wardens, what powers did they have and what were their relations to forest and fire protective associations? You mentioned that they were aided budget-wise in a bad year by supplementary funds put up by the Forest Fire Association.*

COWAN: By the private owners. It didn't come out of the Association funds. Their powers were largely those that they have today. They had the power of arrest for contravention of such laws as existed, and those laws were largely against the deliberately setting of fire on the land of another with intent to do harm. Now, the intent to do harm was where the sticker came as far as the local magistrate was concerned. There was certainly no harm in burning up timber that nobody was using.

MAUNDER: *In other words, if a man wanted to clear some land that he himself owned, he could set a fire and if it just so happened to go off his land onto some other land, it might be a little hard to prove a case against him?*

COWAN: Right. They couldn't prove neglect because he hadn't neglected anything in setting the fire. If the other man was a private land owner and was a neighbor living there, why they generally worked together, but if he happened to be a timber owner back in Minneapolis, why he was a foreigner. He didn't deserve any consideration.

MAUNDER: *Who took up the leadership of publicizing and leading the early propaganda efforts on behalf of this cause? Was it the associations or the Federal Forest Service or who?*

COWAN: No. I think the first real publicist we had was E. T. Allen. He went to George Long, who was manager of the Weyerhaeuser Timber Company, and

told him that they simply could not stand the losses that were going on. Those losses at that time were beginning to increase with the opening up of logging operations, because of the influx of people to the Coast, and the need for lumber, and the tremendous demand particularly on the prairies. Back East there was a tremendous demand in the early '90s with the huge influx of people from Europe and there was a craze on the part of the Europeans who perhaps had been in what might be called serfdom all their lives — they had worked on farms but had never been able to own land. Here they came out to where they could own land for a dollar an acre; they could own it. And they had the ambition to become landed people. They were farmers originally, or at least rural people, and the only tools that were available to them for land clearing were a strong back and a box of matches, and they used both. And therefore we had fires.

When the season became tough we had fires running rampant and the owners — timber owners — were the people who were being hurt by it. Now, timber was bought for a dollar, or a dollar-and-a-half or even two dollars an acre — ten cents a thousand to fifty cents a thousand on the cruises of those days. So it was hard, unless you had considerable acreage, to prove value in the eyes of the local people, but Mr. Long saw and a great many other far-sighted individuals saw that we could not replace the timber losses we were sustaining. They organized and subscribed to the development of E. T. Allen's ideas and so developed, I think, the first publicity for "keep Washington green" that was ever instituted in this state. I give the greatest credit to Allen and C. S. Chapman, who was the District Forester who succeeded Allen.

MAUNDER: *How was the problem of the timber owner who wouldn't join an association handled? What pressure was brought to bear on him and how?*

COWAN: Well, I've been doing a little research into our own organization on what happened in 1914, '15, '16, and '17. Through those several years George S. Long mentions in his annual report to the members of the Washington Forest Fire Association that certain timber owners would not pay their patrol tax and were not shouldering their share of the load. Therefore, they were sheltering under the umbrella which was extended by paying members of the Association; it was grossly unfair and some means had to be brought to bear so that they would shoulder the responsibility which they themselves were creating. In 1917 in the State of Washington the Compulsory Patrol Law was passed and that law defined forest lands as all lands which carried enough standing timber or dead and down — all forest debris — to cause fire to spread. And all forest lands had to pay a compulsory patrol tax. They could pay either into the State of

Washington, in which case they would receive this bill on their tax statement, or they could join a voluntary association such as ours. I must point out that at this time there existed in eastern Washington another private association, the Coeur d'Alene Forest Protection Association. So that in 1917 the Compulsory Patrol Tax Law was passed and started the owners of timber lands paying.

It was not very closely acted upon by the State of Washington. If a farmer had 10 acres of agricultural land and 70 acres of slash, they classified it all as agricultural land and let him get off. And that continued until somewhere around in 1948 or '49. Mr. Bernie Orell began to pick those areas up and have them examined and classified. I had been complaining of it for several years but the State Forester prior to Mr. Orell never did much about it. Since that time in western Washington nearly three million acres of forest land has been classified as forest land. Now, this was not a matter of just being aggrieved because these lands were not paying, but the fact was that these were the lands that were causing the bulk of the expense because they were on farm lands where clearing was taking place and where constantly we had to go out and fight fire at our cost in order to prevent it spreading off these cleared lands, or timbered lands, onto our property, which may have been supporting a second-growth area.

And that is one of the tragedies of traveling around in the State of Washington today. You see so many of these prosperous farms and flat lands, yet the timber all around on the foothills has been burned off. It's carrying an inordinately young second growth today, because the original second growth has been burned off.

MAUNDER: *In the days before the 1917 law there were some timberland owners, lumbermen, who didn't go along with the Association as members. What was the policy in dealing with fire on their lands when it developed? Would the Association still go and fight the fire?*

COWAN: To a limited degree. At that time if a fire was started on a non-paying owner's land, it was ipso facto his responsibility. It did, however, obviously become necessary for us to step in and give him help. At least it became so when I took over the job on the basis that if we let the fire go until it was beyond his control, it was also beyond our control when it came onto our members' lands. We were not necessarily invited in to help him, but we went in to help him. And therefore, our position as claimants for the cost of fire fighting was rather precarious. The result was that we fought the fire for the satisfaction of preventing it from coming onto our lands. If we did that, we'd accomplished what we wanted.

MAUNDER: *What were the attitudes of the railroad companies and how were these companies approached?*

COWAN: Well, the attitude of the railroad companies is rather divorced from what happened with railroad building. The main damage that came from railroading came from the construction of the lines and the contractors operating construction gangs. They were pretty reckless with their fires. There were some bad fires. But, by and large, the railroad companies saw that most of their freight was going to come from forest products. They were good as far as they could prevent or fight fires without going outside their normal railroad functions. It became quite a task to bring them properly into line but it wasn't so very long after fire prevention was brought to their attention that they took pretty big steps, expensive steps, constructive steps, to stop burning.

Perhaps the greatest cause of burning came from two particular sources. One of them was the type of brake shoe that was in use and the curvature of the rails as of the early days before they were flattened out somewhat, and the second was the attitude of the passengers. Passengers tossed lighted cigarettes and lighted material overboard. Brake shoes set fire. So did smokestacks. Later on the railroads began to clear their rights of way and they began to burn strips so they would keep clear of inflammable growth. Over the years they accumulated a pretty good fireproof area which, however, is not devoid of grasses which dry out in the fall and sometimes trains get hotboxes and there are occasions when brake shoes still throw fire.

It was always difficult to prevent railroad fires when they were burning coal or wood. The engines always threw sparks and while in the normal days of the 365 of the year they got away with it, yet we got a few days of low humidity, and a few sparks then would undo the 350 days of good protection. Then, with the coming of oil the danger was cut in two or more than cut in two, but still the necessity of sanding oilburners on certain grades resulted in fires along the tracks. Passengers became better in habit with the constant education that was carried on and the fact that the railroads provided them with receptacles for getting rid of their cigarettes. So it was an accumulative, long drawn out process which resulted in the better education of the railroads. In the process, millions of feet of timber went up in smoke.

MAUNDER: *To what extent did cooperation on the part of the railroads depend on their ownership of forested lands?*

COWAN: I wouldn't say that it depended on it at all. I would say it depended not upon the outlook of management but on the attitude of employees who just didn't give a damn. It was pretty hard to get them to do things.

MAUNDER: *What legal pressures were brought to bear?*

COWAN: The legal pressures were those of levying the costs of fire fighting for fires which could be attributed to a railroad. Juries had very little respect for railroads because they were the Goliaths of industry. A railroad going before a local jury was like a Texas horse thief who was asked, "Prisoner, what have you got to say, because after a fair trial you're going to be hung?"

MAUNDER: *What about the effect of the Clarke-McNary Act in the '20s?*

COWAN: Well, I happened to be present at one or two Western Forestry meetings where that was discussed prior to its passage. And, of course, I knew E. T. Allen and Bill Greeley and so I did acquire quite a good deal of information about it. I think the passage of the Clarke-McNary Act recognizing fire as a federal problem and government's responsibility to its citizens to protect timber for the well-being of the country as a whole, was a tremendous step forward, a tremendous step. I would think that gave the biggest fillip of anything that took place in forest protection on this coast. It recognized that if the state faced its problems that the federal government would help to meet it to the extent that the state expended money, in proportion to the state's expenditure and the private agency's expenditure. And while it did not meet its obligations for many years, nevertheless the money that it paid helped, I think, tremendously in setting up the state organizations, and, of course, was a tremendous help to the private organizations in that the state now also assumed its burden.

MAUNDER: *Who was the architect or architects of that act?*

COWAN: There were two main architects. One of them on the private agency side was E. T. Allen, and the second was Bill Greeley who developed with E. T. the idea of a cooperative association. A lot of the credit also belongs to Senator Charles McNary of Oregon. All through Bill Greeley's life, in everything he did, he believed that you had to have the cooperation of the people rather than have a policeman on the corner. First of all E.T. sold the idea to Charlie McNary, Senator from Oregon, and he said, "If you can get the Forest Service, and through the Forest Service the Department of Agriculture to agree on a bill, I'll guarantee to put it through." So Bill Greeley and E.T. Allen together worked out the Clarke-McNary Law and put it to the committee that came out to the Coast to inspect. And they saw what they were being asked to do and approved the idea and that bill went through the House and the Senate the first year it was introduced. It became a law in '24, was passed in '23. And the final agreement of the committee took place

up at the Snoqualmie Falls Lodge up here which has a commemoration plaque. That's where the Clarke-McNary Bill was founded.

MAUNDER: *When did scientific weather prediction begin to be a factor in fire protection? Was its importance quickly accepted by woods operators or was a lengthy educational campaign necessary?*

COWAN: No, I don't think it was a lengthy job. Now, let me treat again with memory which I admit is a very faulty thing. I don't remember where the fire was; I think it was in Berkeley. A fire started in Berkeley around four o'clock one afternoon and did about nine million dollars worth of damage by six-thirty. My times and dates are approximate. Bush Osborne, who was a member of the Forest Service headquartered at Portland, went down to California and got the weather map from the Weather Bureau and a chart of the relative humidity taken from a hygrothermograph. It showed that the night previous to the Berkeley fire the humidity, instead of going up, went down, remained down all night and all the next day, and suddenly in the afternoon it dropped down to the explosive stage. Somebody dropped a spark near a palm tree, it lit up, the fire ran down the street, as somebody said, "like turning on an electric switch," and houses caught on fire, roofs caught on fire. As I say, there was something like nine million dollars of damage done in the space of an hour or two. The fire brigades from all over the surrounding Bay area were called in to help and there was no help until suddenly around four-thirty or five o'clock the needle showed the humidity went up and there was the fire, under control.

Now, Bush Osborne and his collaborator, Dr. Julius Hofmann, got together and did some extensive research work and they came up with the idea which they enunciated at a Pacific Logging Congress, which I think was held in Tacoma. I was present. They stated that we do not have fire seasons; we have fire days. And they gave several instances of where fires got completely out of control although men were there, men who had gained control of other fires under apparently the same conditions with the same tools. But when they got low humidity and a fire started, zoop, it was out of control.

This was of considerable interest to others, myself included. I began to make some investigations into it and I found that Osborne was right. I further found out by research with Dr. Napier Dennison of the Astro-physical Laboratory in Victoria that we could trace back some of the semi-recorded fires (I use the word "semi-recorded" because they were only recorded incidentally) which had terribly disastrous effects. For instance, there was one fire in—I forget where exactly but I know it was up in the Yukon—in log cabins in February, roofs covered with two to

three feet of snow, the ground frozen, 25 to 40 below zero; a fire started, and the whole place was wiped out. Why? Why did the fire spread so rapidly? Here were log cabins chinked with moss and the moss was dry and the humidity was low. We looked up in the record and we found the humidity recorded at 11. They don't often get these situations in minus zero weather but they do happen and when a fire starts, off it goes.

Now, the same thing was true in the woods, and we found that the history of bad fire situations we had had was carried out by the record as shown at Victoria on their hygrothermograph records. We were interested in this. I persuaded the government (at that time I was Chief of Operations) to buy a certain number of these hygrothermographs and we set them out in different forest districts. We explained to the field staff what they were about. We got sling-psychrometers and explained those to the rangers and we tried to do something about it. We didn't know what because we had no authorization under law to do anything about it other than to warn people that it was bad weather to be out in the woods, bad weather to be logging. "If you get a fire, you won't control it." Here on this side they persuaded the federal government after two or three years to appoint a man as a fire weather forecaster and I think, if my memory is correct, that it was in 1924.

MAUNDER: *Was he part of the Weather Service?*

COWAN: He was part of the Weather Service originally engaged in frost warning service in California. He made a trip through the Douglas fir country and came up to see me, among many other people. At this time, incidentally, I was District Forester, Vancouver. I was still interested in the fire end and helped him to the degree that I could. A committee with the Western Forestry and Conservation Association wrote a pamphlet which was entitled "Fire Prevention in Logging Camps." Mark you, "fire prevention." Bush Osborne was the senior author. There we used low relative humidity as a reason for shutting down because of fire danger in logging camps. We cooperated with the Weather Service there for the first time, as far as I know. George Alexander, the man from San Francisco who was appointed to do this work and was stationed here . . .

MAUNDER: *Weather Service man?*

COWAN: A Weather Service man engaged in frost warning work down in California for the fruit growers. He very rapidly picked up the application of forest conditions to fire weather warning. We set up an arbitrary standard of 30% as the danger point. Well, gradually we got the idea that perhaps 30% was not so much the danger point as the disaster point. There might be another factor in this, such as wind. I was interested in what made these fires run away at that time and I had been making some kind of survey my-

self and reading numerous reports of men who had a fire "under control, but suddenly a strong wind came up, and it was gone." And that was repeated and repeated, not only ad infinitum, but ad nauseum. Why did we have these fires that ran out of control? Well, the answer, of course, was that with low humidity, rarefied air, it's bound to move up, other air is going to come in to fill the space and so we get strong wind in the afternoon. Well, you can't successfully fight fire then so the obvious answer is, "Don't fight fire at all." In the meantime, however, the people on this coast had become by far the best fire fighters in the world because they had more practice at it. And we began to think that something had to stop.

The first airplane was used, I think, in 1922 over the Olympic Peninsula following the Big Blowdown of January, 1922. In 1922 we had a very bad fire here and I thought I would utilize the knowledge that my colleagues and I in the B.C. Forest Service had. We were notified that we were going to have a bad fire day, so we took the only steps that we could think of, with the isolated camps, by telling them what might happen, because to the average logger a good dry day was a good day to log. They never worried about fire until they had one. And then generally they'd "had it." We had the use of a government-owned airplane, HS2L flying boat, so we printed a number of handbills and we had the Royal Canadian Air Force fly our man with all these handbills over the many scattered logging camps and drop the warnings to them. "It is too dangerous to log now," we advised them and we suggested that they shut down because of low humidity.

That was in 1922, and we helplessly floundered along until 1926. We talked about shutdowns and our Washington Forest Fire Association developed a system in 1927 whereby when we got the forecasted weather warnings, we wired all our members or phoned them, 147 of them. We had in various phone offices a statement of List No. 1 and List No. 2 and List No. 3 and they went into action and sent out telegrams, and where they couldn't get telegrams to them, there were phone messages. We had the system organized. However, we only told them that dangerous fire weather was forecast. That was all we could tell them. We had no power to order operations to cease.

MAUNDER: *To what degree did you get cooperation from them?*

COWAN: They were wonderful, wonderful! From the more responsible people it was just as you would imagine it would be. They went whole hog and shut down at once. From the irresponsible or the small so-called "gyppo logger" and in many cases isolated loggers who didn't get warnings, or rather whose owners didn't get warnings and their superintendents did but ignored them, the warning failed to obtain proper ac-

tion. But, by and large, we got wonderful cooperation on the shutdown, so much so that shortly afterwards when Matthews and other men in the experiment station at Portland began to come up with the idea of fuel sticks, and I came up with the idea that if you're going to use fuel sticks, you've got to use wind too, take in all the factors — we found that the loggers by this time had begun to accept these ideas, not all of them by a long way, but all the principal ones.

Then along came the depression and the advent of the Lumber Code and Bill Greeley, Chapman and myself sat in the office and they said, "Here, you write this part of Article 10; tell us what you want as a means of preventing fire." Here was a ten-year dream put into my hands and the chance of making it come true. I put in this clause: "When, in the opinion of the State Forester, fire weather conditions create danger or hazard, he has the power to close such districts and for such time as he may see fit." I showed this to Fred Brundage. I don't know if you know Fred. You might make a point of talking to him. He's retired now from the Forest Service, but at that time he was in charge of fire control for the Forest Service, and he went for that hook, line and sinker. And so it was put into the Lumber Code and then the Lumber Code was killed because the Supreme Court found a chicken in interstate commerce. Do you remember that? . . . And there went the Lumber Code. By this time we'd had two years' experience and after putting it up to our trustees and going to our members, I went down to the State Legislature and lobbied that thing through and we got it on our own law books.

MAUNDER: *Did the other western states follow suit?*

COWAN: They followed suit in a little different way. Oregon has the 30% humidity law and later they put in wind, but they still use some arbitrary point, whereas in my own warnings I have many a time told a man, "We don't expect the humidity to go down below 38 or 35; that's the minimum that's forecast. But they're forecasting a 40-mile-an-hour wind and if you get a fire, it's gone." They shut down. . . . I had in the back of my mind, before we knew anything about relative humidity, that we had always had this "strong wind" which came up and then we were lost. The story, THE BIG BLOWUP,¹ shows that right through — a strong wind came up. So then as we got more experience we shoved wind into the picture. Then developed, I think in Minnesota, the fire danger rating meter (and we have an approximation of that more suited to our area here based on that Minnesota fire danger rating meter). So I think that, by and large, that's a pretty full answer to your question of weather predictions.

¹ Betty Goodwin Spencer, THE BIG BLOWUP (Caldwell, Idaho, 1956).

MAUNDER: *In other words, you'd say that weather prediction now plays a very considerable part in fire protection?*

COWAN: Yes, I would say so much so that it's very rare for me to go to any responsible lumberman in the field and not find fire weather instruments. And because climate in this state is micro-climate and it'll change from valley to valley, from a north and south drainage to an east and west drainage, that responsible operators shut down probably more of their own volition than because of state action.

MAUNDER: *How have changes in logging methods affected danger of fire in the woods? Are these the result of developmental changes in attitude of the lumberman, or the necessary compliance with legal requirements?*

COWAN: No, the change has come about from all three factors. Primarily, the change in equipment is all to the good because you've got to remember that the original equipment, that is, the power equipment used, was steam, and steam was secured from wood, wood burners. Wood burners were cinder throwers, particularly the original underpowered machines that had to snort pretty hard to get the required power to pull a big, heavy log. Of course, that's moved out of the picture. Then the second part of your question was?

MAUNDER: *Changes in the attitude of the operator.*

COWAN: The operators' attitudes have changed as the economic values involved changed. Not only that, but they have changed because of a more responsible citizenship idea on their part as well. It's been both. The operator is not the transient that we used to have, the man who went in to log a 40 and then moved on to another 40 elsewhere and didn't care what happened; never stayed long enough in one place to see what happened if he did have a fire or didn't have a fire. Responsibility has grown with values and the type of man involved. Now, the third part of your question was whether it was legal restriction. Well, of course, we've always put on legal restrictions and we've developed our legal restrictions and made them responsive to changing conditions. As the finer type of man observed the responsibilities of citizenship to his state and to himself, and as the irresponsible man sheltered under that umbrella — and there are always irresponsible men and that is why we have police and highway patrolmen, to look after that type of man — our laws are made restrictive. But I would say, by and large, that the vast majority of the output is produced today by men who don't need those laws, but it's just as well that they're there.

PART II

MAUNDER: *Charlie, we were talking the other night about the history of the cooperative efforts to fight*

fire in western United States and Canada, and we covered quite a bit of ground in that interview, but I would like to go back and identify a little bit who you are, where you came from, what your background was, and how you first got into forestry itself. I believe it was up in B.C., wasn't it?

COWAN: Yes, in British Columbia.

MAUNDER: *What year was that?*

COWAN: That was in 1913.

MAUNDER: *And what was your previous training?*

COWAN: I'm a forester. Actually I'm a forest engineer. I was trained in forestry and engineering.

As far as my experience in protection is concerned, when I came back from the first World War, went back to the B.C. Forest Service where I had been engaged prior to that, I was in the management end of it, actually in extensive reconnaissance and to some degree a forest assistant in the Vancouver office. I was Assistant District Forester prior to the War. When I came back there had been a complete exodus out of the B.C. Forest Service; every trained man, except two, had volunteered for war service. I was asked if I would take over R. E. Benedict's place until he came back. Benedict was the man in charge of forest protection or of the Operation Division. Actually, Benedict never did come back so I stuck on from 1918 until 1924 when I became Regional Forester over at Vancouver, which includes Vancouver Island and the coastal area of British Columbia — the southwestern coast of British Columbia, south of the Queen Charlotte Islands. Of course, as Regional Forester my work was not divorced from forest protection because forest protection is part of the whole picture.

One night I got a phone call from George Long asking me if I could be in his office next morning. So as a result I came down here. That was in 1927. And since then I've been working at forest protection. I came to an organization which had been without a real directive head for two years. Actually, it had two heads, one for the north and one for the south, and neither one consulted with the other.

MAUNDER: *This was the Washington Forest Fire Association?*

COWAN: This was the Washington Forest Fire Association. So I tried to bring order out of that. I found it was an association that relied absolutely on its forest protection being done by the private owners, except for fires which occurred outside their operating area. But to do that we hired men with cars and paid them so much a year, \$50 a year for their car, and supplied them with tires and oil and gas, two or four tires depending on the length of the season. Men were going to fires and having to stop to repair tires, because naturally under that kind of condition they bought second-hand cars and a second-hand car in

1927 was really second-hand. The only thing you could be sure of when they sold a used car was that it had been used. No other part of the guarantee was good.

The next year I persuaded our Trustees to buy me six pickup trucks and six pumps and 6,000 feet of hose. The state at that time had neither trucks nor pumps and I was able to make a deal with the state man, George Joy, whereby, if he bought pumps which would be physical property and accountable, we would buy the hose which would be expendable. It would be easier for us to buy it without the red tape that was associated with governmental purchases. So they bought pumps and we bought some more and we supplied all the hose and gradually we built up a fleet until every district had at least one truck to operate from.

One of the other tragedies of this game was that when the district warden went out, everything stopped. There was no one to take telephone calls, so I instituted a system, with the consent of our Directors, whereby I paid the wives so much so that on all fire days they would stay at the telephone. We also saw that they had telephones in their houses. We paid for that installation because normally they didn't have them. So we first started out with a setup in 1928 whereby, when people called in to report a fire, there was somebody there to receive the call.

During the course of that year I found out that certain of the men who were really faithful men, good woodsmen, had been put on when their active lives in the woods were pretty near done, but due to connections with the Association they found a job for these men, and while they were good fire fighters, they were getting to a point where they couldn't go out and fight fires. Consequently, I felt that they should not hold a field fire fighting job. Nevertheless they had a knowledge which we could utilize. We put on younger men whom they had trained. We then utilized the older men as dispatchers instead of their wives.

After consultation with George Joy who was particularly loyal to his men, we arrived at the conclusion that the following year, 1929, we would start some kind of branch office. These men would be there to receive fire reports. With their knowledge of the country, if one had to phone back and get some men sent up, they knew where to get the men, what tools they should bring and where to get them, or do whatever things were necessary. So in 1929 we started by dropping off four of our district wardens and then putting them on as dispatchers. That meant that we had to acquire office room, but that was the start of branch or county offices. Under the laws of the state the county was supposed to supply offices for the fire warden, but that was done only in three places. Mostly, the county seats were not the best location for a district warden, so we got into the way of renting offices and that was done until 1931 or 1932.

In 1933 the CCC came, and then, of course, the state was entitled to get the benefit of the expenditures authorized and the state started to build, in each county headquarters, a state Forest Service fire hall which contained their headquarters and an office for the various dispatchers. These older men dropped out fairly rapidly. Some of them were succeeded by their sons, one of whom is still active. The others dropped out and went into other activities.

One of the reasons I was speaking to Stuart Moir¹ about the Spokane meeting—at Spokane when I was chairman of the Forest Protection Committee, or at least I was sitting in the chair, I gave vent to a thought that had been worrying me for some time. That was that in going out into the field I found that we were using mattocks, big heavy tools weighing seven to nine pounds that were made for grave diggers or ditch diggers, and because they were available we were using them in fire fighting. But they weren't the best tools, and I felt it was about time that we developed a tool that was designed for us. We were using heavy hose that weighed 30 pounds to 50 feet. We were using old screw couplings and the threads would get jammed and turn together. It was time that we got away from that. We ought—instead of using the mill hose because that was the stuff available—we ought to have a hose that was made light enough for men to pack on their backs. And so out of that meeting came the start of forest fire equipment research.

MAUNDER: *What year was that?*

COWAN: I think that was in 1931 in Spokane. . . . It was very early in the '30s. The result was that the Forest Service sent Bush Osborne to headquarter in my office and I would act as guide to Bush and push him along on certain specifics that we had to obtain. He was to be paid in part by the WFFA, the State of Oregon, the State of Washington, and the Oregon Forest Fire Association. And out of that research work that was done by Bush Osborne came light-weight forest fire hose.

Now, a few years prior to that, as a result of looking at air hose and its quick snap connection, I had developed a presto coupling with a universal connector, which is still in use. One-eighth of a turn and your hose is connected, and it relies on inside water pressure to make the seal; two pieces of rubber gasket being pressed tight by the water seal one against the other. And we think of that as a tremendous improvement over the old hose because no matter what end you run out they all fit, although the vast majority of hose used is still the old male and female screw couplings.

¹Stuart Moir, formerly Forest Counsel for the Western Forestry and Conservation Association, now a consulting forester, was present during the second half of the interview.

In the meantime, Bush Osborne and myself had been tinkering around with what became known as the Osborne Adze Hoe and Bush was by far the greatest contributor to that development. I had some idea of what I wanted and Bush took it up and worked on it until it was a practical tool. Bush was a very deliberate worker. Everything had to be perfect before he'd be content, while I felt the season was getting on and we should try it out by empirical formula. I took the drawing down to the Isaacson Iron Works and that company was willing, big as it is—it's a huge company—they were so hungry for work that they took an order for a dozen. That's the minimum number they could make. They cost us \$12 apiece because they were hand forged, but we did get a dozen to put out in the field and test that year. Now, I can remember that the man I took them to, George Frisk, who was I think probably one of the most progressive fire fighters we had in the organization, he just looked at them and said, "They're not worth a damn."

And I said, "George, you just take half-a-dozen and you use them on this particular fire you are working on, and find out."

MAUNDER: *How did they differ from the old?*

COWAN: First of all, they weighed about two-and-a-half pounds instead of seven or eight. They had a square eye instead of a round eye so that they didn't revolve on the handle. The handle was curved like an ordinary carpenter's adze so that you didn't have to wallop so much. It had a curved cutting blade. It was a cutting and a scraping tool, in that actually the user could draw material to him, and because it was a true temper tool he could actually chop through a lot of roots with it. It was light, easy on the men. It was two-and-a-half pounds as against seven-and-a-half pounds so you see it had a tremendous advantage in those days when everything was back-packed out to the fire. And it was much easier on the men; they didn't get blistered hands. The handle, because of its curve, would always remain true to the blow.

That night after delivering them—I took them up myself—George Frisk phoned me and wanted me to send up three dozen, but, of course, we only had a dozen made and six of them were elsewhere. But that was the start, and that fall we gave them to a couple of companies and asked them what they could make the tools for and in what quantities. The Forest Service apparently took to that tool because some of their men in the field had seen it in operation. They came through with an order and they specified the kind of thing it was. The True Temper got the order and they turned them out for us for \$1.50 for the head and 50¢ for the handle, which is a very nice price as compared with what they are today. Now they are in universal use and specified for use legislatively. The lightweight hose is also in universal use.

Osborne was also working at that time on the development of a camera which would be a theodolite, or a transit and a camera. It would take pictures according to the true north and would take a whole panorama of 360 degrees and print the angles of the azimuth on it. These have become part of the lookout systems in a great many places now.

I was working with a bunch of practical people as directors who had met me in their camps and knew that I got out into the field and who were willing to listen to the facts as I found them. They put up the necessary money loyally. And right through the depth of the depression, even when taxes were falling behind because the companies just didn't have the money to pay them, our Association was never more than two per cent behind in its payments.

MAUNDER: *I was going to ask you about that. This was done at a time when money was hard to come by and still you were making recommendations that obviously were calling for expenditures that hadn't been made in previous years. Do you credit this to the zeal that these members had for the cause of fighting fire?*

COWAN: The cause of protecting their lands. They were firmly convinced in the early days through the tremendous leadership that was exercised by George Long. When George Long advocated certain steps, people listened. They tried to follow. For George Long was a real statesman. Because of his innate modesty, the tremendous regard in which he was held is not generally understood. You and I both know that when you write reports, you outline the President's message. But I just had to tell him that certain items had to be emphasized, because he had made those same statements time after time himself, in different language, at different times. The fire prevention idea was fully as much his as it was mine. George Long had a tremendous influence on the industry here and when he wave a word of caution, it was listened to; and when he gave a word of advice, people at least weighed it. People would follow George Long when they'd be very loath to follow anybody else.

MAUNDER: *By the way, what had he done that gave them that confidence in him?*

COWAN: First of all, he had a thorough understanding of timber. Second, he had the ability, I think, given to him far more than other men, to look ahead to see the future in his mind's eye and see the values that were there. Primarily, it was the fact that George Long's word was good. He held to it whether it was advantageous for his company or not. Once he'd given his word, it was good.

For several years Western Forestry and Conservation Association was operated out of my offices. I became a sort of permanent chairman of their forest protection committee, simply because I was the only one who would undertake the job.

We had set aside one special day when the fieldmen, the non-technical foresters, the men who were engaged in field fire fighting could get together and listen to a discussion and air their opinions, and some of them were pretty frank and pretty brutal. Among other things we found out that there was still a wealth of legend floating around in the minds of some of them. But after those meetings were over, there came annually a re-emphasis on the fact that men, with a certain set of equipment, certain tools, when they came to a fire, could attack it and put it out, while at another time, the same men, seeing the same fire start, with the same equipment, were helpless, even when the fire started under the same general conditions and slash. So that fact re-emphasized that there must be some one factor that was responsible for this because you had the same men and the same intent and spirit and ambition to surround a fire and put it out.

We felt that this gave tremendous emphasis to the work that W. B. Osborne and Julius V. Hofmann had done in bringing out the facts of fire weather and the necessity for taking advantage of the information you could get through fire warnings. Constantly it was reiterated, but it took some time to put it over until we finally were able to do it under the Blue Eagle, and when the Blue Eagle died after the Supreme Court decision, we were able to carry the idea the very next year to our own Legislature. . . . It was opposed by the State Forester, who felt that this was a responsibility that he should not have, while I argued that if he didn't accept this responsibility, he was accepting the responsibility of having fires get out of control. Nevertheless, he had some real reason on his side. In 1934, '35 and '36 work was scarce, and if he shut down an operation he was stopping men from earning a living that particular day. My argument was that we weren't taking it away from them, we were postponing it for two or three or four days.

The State Forester was also right in that the industry didn't accept it one hundred per cent. The result was that he administered it rather charily, that is, it had to be really explosive weather before he shut down. Then was the test. The loggers began to complain that he was shutting down too late, that this order should have come out before, and the good loggers began (by good loggers I mean the observant loggers who wanted to prevent fires and would go to some extreme to do so) to get in their own instruments and to shut down prior to the state order.

MAUNDER: *Who were the companies that did that in those days?*

COWAN: Weyerhaeuser, Crown Zellerbach, Long-Bell did it. Maybe I'd better ease up. They had the instruments but the superintendents weren't always good at shutting down because the men they had at

the time were more intent on logging than looking at weather records. But the Weyerhaeuser Company deputed certain people to check them. St. Paul and Tacoma did it; Rayonier, when they came into the picture, did it. Simpsons were great. At that time they had George Drake and, of course, he followed the weather conditions very closely.

MAUNDER: *Were these instruments expensive so the smaller companies couldn't afford to buy them?*

COWAN: No. The recording instrument was comparatively inexpensive, around \$145. It cost about \$45 to make a proper shelter for it, an acceptable shelter which would allow the instrument to work. Then, in addition to that you had to have a psychrometer to read so that you could check your instruments. The small logger could buy a \$12 instrument and by using it he would know what the condition was at any time he read it, but it didn't tell him what was happening at night, and I was very worried about that because here we had inversions. Humidity generally rises at night, and we had periods when it did just the opposite and remained low all night. I've fought fire and at two o'clock in the morning I went out and checked the humidity and found a humidity of 24 per cent!! I might add that the next day that fire exploded.

We had some bright gentlemen who were superintendents. I can remember one particularly. I was making an impression on him about what relative humidity was and did, and I wanted to explain everything, even to the fact that it was actuated by human hair, the relative humidity part of the hygrothermograph, and that hair had to be blonde hair because of its shape. The temperature side was a hollow shell half moon in shape, and filled with spirits of wine. That expanded with the heat and actuated a pin which showed the temperature on a chart. He was quite interested in it, I thought. I thought I'd won a friend and when I was finished I said, "Well, now, you'd better get one of these in your camp."

His answer to me was, after all my hour-and-a-half talk, "If you think I'm going to open and shut up my camp by the hair of some blonde that I haven't even met, you're crazy." And that's as far as I got. So it was not altogether a wholehearted acceptance by the men in the woods, and it wasn't until management began to say, "This is what we want," that the men in the field began to do things.

MAUNDER: *Is there anything more you would like to add on the early use of airplanes?*

COWAN: No. The only other item I can mention is that during one year we contracted with a private pilot and he put on two what he called "bull horns" or very loud speakers on his airplane below the wings or on the struts, and we cut a tape which gave forest protection warnings. "Be careful of your campfire," "Don't throw away your cigarettes," "This is forest

land; please keep it growing a new crop to keep our industries alive," and so on. On certain fire weather days, particularly during the berry picking season and during the opening of the hunting season that year, he flew over certain specified areas and turned on this business when he got in the back country. Flying at 5,000 feet this voice went booming out. With a ten-mile-an-hour wind we could hear him eight miles, that is, distinctly eight miles down wind and about a mile on either side, which gave him a tremendous scope with this thing. We had a great many favorable comments on this innovation.

To go back to the fact I mentioned that we do these things experimentally because we are freer to move than say, governmental agencies—if we think the idea is worthwhile trying, our Trustees are willing to spend the money to try it and then hand it on to the people who should carry it on if it will aid in fire prevention. Well, this idea was of such value that the state hired that man the following year and they used him in the same way. The following year in eastern Washington they had the experience of people lighting a bonfire rather than a campfire. He spotted it and flew over it. His voice came booming out of the sky because he had a loudspeaker with him, and he told them to get that fire down, that they were being noted, and a fire warden would come up and see that it was done, and please get the fire down now. That was one instance. And then we heard a great deal from hunting parties that were out who said this was a fine idea. The other fellow was always the fellow who was the danger, and this kept him down. Of course, nobody ever thinks of himself as a danger.

MAUNDER: *Well now, you've been in close touch with the causes of fire for a good many years. What could you say about the changing trend in the causes of fires? Are they still the same, or is there a change in the pattern of the causes?*

COWAN: Well, there's somewhat of a change. The only thing that stands out is that through the last 25 or 30 years the percentage of fires started and caused annually by the recreation seeker has remained pretty consistently between 30 and 33 per cent year after year. I'm speaking here of the cigarette smoker, the picnicker, and the people who go out hiking in the woods—the people who just go out to enjoy being in the woods and therefore should be the most careful of all. When it came down to 28 per cent, I noted it particularly in my annual report. I'm a little doubtful about whether it was 28 or 29, but it was below 30 per cent one year and, of course, it bounced back again. It seems to have a fixed percentage right through. Now, the loggers at one time, logging in the earlier days—I made a record of 20 years, I think, at one time in the early '30s, I think it was in '33—were responsible for about 25 per cent of the fires and

for about 45 per cent of the acreage burned. Now, let's leave that there as what it was for '33.

Now, let's look at what it has been lately. They're responsible for between two and three per cent of the fires and about one or two per cent of the acreage. Now, we can get a tremendous lesson out of that. I mentioned before that we recognized what relative humidity is. When the humidity is low they're not logging, so therefore any fires that do occur occur at a time when they can secure control. There you have the application of our scientific research to the practical business of logging and fire suppression, and we find that it is really good.

That has also been carried into the operation of land clearing because permits to burn are not issued during dangerous fire weather. The state deserves the credit for this. Now, permits may be issued for eight or ten days and run into dangerous fire weather, but in such cases the state makes every effort to notify the man to get his fire out and often sees that he does get it out. Of course, they get caught occasionally, as they're bound to, because they can't cover every permit. They issue around 100,000 a year, a tremendous number.

I don't think that forest protection started to make any real advances until we took it out of being solely in the field and brought it into an office and took a look at it to see what was happening. In other words, we brought it in and put it under a microscope to see why certain things were happening. When we left it simply to the field, it remained a matter of attacking a fire with the greatest number of men available, with the tools that were available. There was no thought as to whether those tools were the right kind of tools or what kind of tools should supplant them; whether there was a better way of doing the job; whether there was a time to attack and a time when you couldn't do anything so that you'd better lay off and let the fire go until the weather changed and avoid having the men cut off and burned. There was no lesson in prevention to be learned that way. So there was a place for, as you called it, the fire mathematician; I would call it fire research. And with this action I think we really got progress.

We brought in to help the same tools that the loggers had brought in. We brought the engineer in with us and found out what he could give us in the way of pumps and hose. We found the American manufacturer, if he thought he had a market, was willing to go after it. You've got to remember that the first pump, which was started in Canada, came originally from a little inboard motor, a Waterman engine, and then developed through to the Evinrude engine, and then several other engines out here. It developed largely from an outboard engine, the Evinrude, and one or two other engines which I forget the names of, a similar type. Then one company took it up and

picked up the Northern Pump, which was manufactured at that time, I think, in Minneapolis, and tied that onto a Johnson motor, which was an outboard. And so developed the pump which came down from a two-man job that supposedly weighed 65 to 70 pounds to a job of five or six horsepower that a man could pack on his back because it weighed only 39 pounds. And we got a still lighter one that had a one-and-a-half horsepower motor that would push water through a one-inch hose. Pumps developed, hose types developed, until we got a system in practice which was very, very valuable.

And then as truck logging moved into the picture — well, even prior to truck logging we built ourselves a couple of tanks and hooked them up to a fan driven belt-drive pump attached to the motor, thus utilizing automobile power, and we placed small tanks on a pickup truck. If a small tank of 80 gallons was good on a pickup truck, why 500 gallons on a bigger truck would be even better, until we moved to 1,000 gallons with a power take-off from the transmission. By that time the road systems were developing in logging and we were able to use them in fire fighting, and then the loggers took them up. Of course, they moved as loggers do — if 1,000 is good, why 5,000 is better — until they got them bulky, but we were able to persuade them that perhaps they'd better have some lighter machines because 500 gallons on a fire now may be better than 5,000 gallons half an hour from now. You want to be able to roll up to a fire quickly. And that is the system that is being used, with the heavier trucks following up. But I don't know if we made the first tank truck. I think we had the first in the State of Washington.

MAUNDER: *If that's true of mobile units that can be moved into the woods on wheels, why isn't it just as possible to tackle a fire problem with a tanker-type plane that could fog down a hot-spot area?*

COWAN: Well, that actually is being done, but wa-

ter, to fog down a hot-spot area, is not very profitable.

MAUNDER: *I was thinking of using a chemical, not water.*

COWAN: I think the best chemical we've got right now is calcium-bromate and it really fireproofs an area, fireproofs the materials it falls on. There are, however, many difficulties attached to its use. For instance, it cuts out pump gears. Pump it through for about 10 minutes and then the pump is done. But a method of using this calcium-bromate has been developed, and it was used last year on a great many occasions. Pilots have to fly at an altitude of less than 200 feet and let go the whole tank load, 200 or 300 gallons, in one fell swoop. If you don't let it go in a hurry it evaporates before it reaches the ground and then, of course, it's useless. It's got to be made up into what is called a "slurry." It has to be mixed before they put it into the tank plane. But they've been able to hit a lot of hot-spots of some rather bad fires. But the full evaluation of that will be made later this year and I would strongly suggest if you're going down to California that you get in touch with Keith Arnold at the Forest Experiment Station at Berkeley and see what information he has on it. He is doing fire research work and has a very keen mind and a splendid way of presenting the story so that he gets a hearing. Now, there's no use getting this information and keeping it to yourself. It's got to be spread, and it's got to be spread in such a way that people become interested in it, and he has that faculty.

Typescript copies of this interview are available at the Universities of British Columbia, Oregon, and Washington; at Washington State College; and the offices of the Pacific Logging Congress, Washington Forest Protection Association, Western Forestry and Conservation Association, and Western Pine Association.

Any questions or comments should be addressed to FOREST HISTORY, 2706 West Seventh Boulevard, St. Paul 16, Minnesota.