



# The U.S. Geological Survey in the Early 1900s—

## Reminiscences of D. Foster Hewett, Adolph Knopf, and Frank C. Calkins

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## Introduction

In December 1962, Donnel Foster Hewett, then age 81, hosted a dinner party for what was then the “younger crop” of U.S. Geological Survey geologists in Menlo Park, California. His purpose was to give them the benefit of some collective wisdom as to what life on the Survey had been like in the “good old days,” with particular respect to the personalities of some of the men who had played prominent roles in the Survey’s development. To this end he recruited two other Survey old-timers – Adolph Knopf (80), a Visiting Professor at nearby Stanford University, and Frank Calkins (84), a USGS Annuitant in the Menlo Park headquarters. Following a convivial dinner, these three distinguished gentlemen delivered their remarks to an appreciative and responsive audience.

In an act of great foresight, someone – I am not sure whether it was Hewett himself – had arranged to have the proceedings tape-recorded. I obtained a copy of the tape some years ago and have recently completed the pleasant task of transcribing it. In editing this transcription I have tried mainly to do two things: (1) to record the speeches as nearly as possible verbatim, except for frequent hems and haws, repetitions, and an occasional verbal stumble, and (2) to recreate the ambience of the occasion by noting occasional interruptions of laughter and applause where they were significant. As to the former, a handful of words or names were either altogether unintelligible on the tape or unfamiliar to me, and I’ve indicated my best guess with a query in brackets. (I thank Al Bush, Dennis Cox, Bob and Mereth Meade, and G.I. Smith for their help in clarifying a few such items.) As to the latter, I have omitted numerous minor chuckles that occurred and will leave it to the reader to supply these on the basis of his or her own instinct.

Even with such editing, this written account is no substitute for hearing the businesslike sibilance of Foster Hewett, the rich professorial timbre of Adolph Knopf, and the mellifluous, rumbling bass of Frank Calkins. To rectify that shortcoming, copies of the two 60-minute audio-tape cassettes have been deposited in the USGS libraries in Washington, Denver, and Menlo Park, where they are available for short-term loan. In addition, the tapes are being open-filed as Part B of this report. Total running time for the three speeches is about an hour and 45 minutes.

Appended to the speeches here are very brief biographical notes on these three Survey giants, condensed from their memorials published by the Geological Society of America.

### D. Foster Hewett

This is a Survey party. Everybody here is involved with the Survey except Adolph [Knopf] and Charles [Park], who once were and had a very honorable record. So we had to include them. But this is a Survey party.

Maybe some of you have noticed in late years that I’m inclined to reminiscence (laughter). I admit the charge before you make it. I was reading in the paper the other day – you know these doctors’ columns? – doctors give free advice about... Somebody asked, concerning their parents, “What are the evidences of senility?” (Laughter.) And they said, the doctor replied, “Why, the tendency to reminisce.” Now, maybe I ought to recall our old friend Patrick Henry – you remember Patrick Henry said, “If this be senility, then let us make the most of it!” (More laughter.) Well – several of us thought, we cooked this idea up, that this crop – there are several crops of Survey here, may I say generations – Adolph’s and Frank’s [Calkins] – of course Frank started in 1901, that’s only 61 years ago – Adolph 1911. Now then there’s a lapse, up till about Bill Pierce and Phil King’s generations – 1928, Bill? ‘28 – 9, Phil King ‘30 – but most of you that are here started

around '40 – Ward [Smith] started in '38. Anyhow, it seemed to me, looking toward some sort of amusement or gaiety, that it might be worthwhile if Frank and Adolph and I looked back on the old days in the Survey, not so much to look at the purely professional activities and attainments, but to look at these men that were running the Survey, and I've chosen 1910 – fifty years ago.

Now, briefly with regard to the Survey in 1910: Maybe I ought to go back to 1880 – I read the first Annual Report the other day, and I found that the first appropriation was for a hundred thousand dollars, and so help me Moses they only spent eighty! (Laughter.) Now King of course was the boss, but there were nine geologists and seven assistant geologists. Now, soon after it was formed, they entered 1330 F Street, which was known as the Hooe Iron Building. If time permitted, and it doesn't, I'd like to tell you a lot about the Hooe Iron Building, because it was a four-story building, you entered up some stone steps and then the ceilings were 16 feet high on the first floor, 12 feet high on the second, 8 feet high on the third and about 6 feet high on the fourth. Now let's jump from 1880 to 1910, thirty years. We now find the appropriation is a million and a half dollars, and they have 74 professional employees in the Geologic Branch. Now – the thing that I thought might amuse you – they occupied exactly the same space that the original crop in 1880 did! (Laughter.) And they grew – they accommodated you by simply subdivision. Maybe they did this in family life – I don't know – maybe you have to subdivide the house as the kids come along. But anyhow, they just kept subdividing. Adolph was on the third floor, I was on the fourth, and if I wanted to see Adolph I almost needed a guide, because it was a labyrinth. That famous third floor was the most fantastic labyrinth. Anyhow, I wanted to mention briefly about 1330 F Street because our memories all started there.

Now, you've probably heard that what's now known as the General Services Building, we entered in May 1917. Now soon after I arrived on the scene, George Otis [Smith] began to talk about a new building for the Survey (chuckles). And at least 5 or 6 years before we moved over there, the theory was, the Survey, just as it is right now in Washington, the Survey was supposed to get a new building. Well, then occurred down – here was this four-story building with a court in the rear, and all the engraving and printing was back in a separate building. And there was a big fire back there every year. And in the Pick and Hammer Show we took George Otis off and wanted to know how he happened to set those fires. Because that was come-on stuff so as to get the new building.

Well – now we're up to 1910. And I want to talk about, briefly, between '10 and '15, maybe a few more men that I came to know at that time; I arrived in 1911. Perhaps I might confess to you, I'll tell you why I went with the Survey. I graduated in 1902 as a mining engineer, and somebody had the nerve to employ me as a mining engineer. And as I worked at it, I became impressed that I was more interested in geology and mining districts than I was in mining. So... I married, went to New Haven [Yale] in 1909, joined the Survey, and I joined – why? Because I wanted to do mining district work the way the Survey did it. Now what I didn't know – and this, I might say, is the theme of what I shall say in the next few minutes – the bunch of men that I was going to know. It's like a lot of things in life; life is a curious mixture of planning and luck. You may recall Bill Shakespeare makes Hamlet say at one time, "There is a destiny that shapes our ends, rough-hew them as we will." Well, I've tried to rough-hew something, but luck – good God; I've been lucky as hell. I thought I was smart when I married Mary, but actually, I was lucky as hell! (Laughter and applause.) What I'm trying to bring out is simply that I had a purpose in going to Washington to the Survey, and I didn't know the men I was going to know and associate with, and that's the theme of what I shall say.

The first person, member of the Survey, that I met was James [Josiah] Spurr, by a curious twist in 1905. In 1905 I went to Peru, bumped into a vanadium deposit down there, and by that time I knew that W.F. Hillebrand was a chemist. And as soon as I got back in the spring of 1906, I wrote Mr. Hillebrand, would he be interested in looking at these vanadium minerals? So very kindly he took over the whole chore of analyzing these minerals, and out of it came I think ten new minerals. So I met Spurr in 1905, I met Hillebrand in 1906. And in 1909 we go to New Haven, in 1911 to the Survey, and here we are.

I'm going to read down a list of names, from the oldest to the youngest, about 25, and then make a few comments on these men. Of course it would be presumptuous if I were to attempt to make an appraisal of these men professionally. Some of them I might. God knows I wouldn't want to try to appraise T.W. Vaughn, and yet I came to know him very well. In other words, I'm not going to presume to tell you what the professional attainments of these men were. But I thought you might be interested in what kind of men they were; you might say how they conducted themselves. They had the entire range from old sourpusses to perfectly delightful men... George Becker was an old sourpuss. When I arrived – as of the year 1910 George Becker was 63 years old, and he was head of what they called the Division of Chemistry and Physics. I had a notion one day, and God knows how I got it, that I wanted to talk to Mr. Becker about something. So I went upstairs, fourth floor, knocked on his door – “Come in!” And he had a casserole in his hand – on his desk in front of him, and I would see, he would reach over and pick up something and drop it there and then look at it. And I found that these were flakes of Ivory soap. And he dropped them in there and the damn flakes started to move around! Well he was proving some principle – I don't know what – but – that was my only personal acquaintance with George F. Becker (laughter).

Now... Frank W. Clarke. Frank Clarke was 63 as of 1910. I had a very great advantage because in years gone by I had been in public school in Washington with Mildred Clarke, Frank Clarke's daughter. And when we went to Washington, Mary and Mildred became very close friends, and that gave me what might be called an entree to Dr. Clarke. You may recall the first edition of the Data of Geochemistry came out in 1907, so that's pre-1910. But it went through, as you know, five editions and became a best-seller. He was curious; he had sideburns... Most of you would be impressed that he was a very sour individual, but actually he had a very keen sense of humor and a very quick wit. And I recall this story on him, someone said, “Oh, Clarke, how's that Chimerical Society of yours?” And he says, “Why it's fine – how's the Notional Academy?” (Laughter.) The thing that impressed me about Dr. Clarke – I had a certain personal acquaintance with him, but it never seemed to me that Clarke was hard at work. You'd go down to the library and he's browsing around in the shelves of the library... Well, was he working? How many papers did Dr. Clarke write? You needn't guess because you'd be foolish – two hundred and ninety-three! In other words he was an amazing human being. Perhaps I ought to say right here that in those days, this crowd of men that I'm going to speak about – probably more came from Harvard than from any other college. Another good part came from Hopkins, there were a couple from, two or four from California, several from Chicago, the ones that I'm going to speak about. But Harvard, certainly, started with a lot of men there, and the curious thing was that after 1908, when Phil Smith came, nobody came from Harvard to the Survey until Bill Pecora in '39. (Laughter.)

Now, let's pass on to Dr. Hillebrand. He was 57 as of 1910. My ties with him were wholly through this vanadium business. I would rate him, first of all, as probably the best mineral-rock chemist in the United States for his generation. Of course he was basically a laboratory chemist – somewhat different from Clarke. I don't think you could say that Hillebrand was as much of a

research chemist as Clarke was. It impressed me very quickly; Hillebrand was one of the *kindest* men I've ever known in my life. It's just inconceivable to me that Hillebrand ever made a harsh remark about anyone. Well that he wasn't idled in those days – he only wrote 89 papers in the 60 active years.

Now we come to Whitman Cross. Whitman Cross was 56. Now, he was short, he only stood about five feet four or five, but he was certainly a good mountain man. I know nothing about him in the field. Fortunately we had, I might say, some social intimacy, Mary and Mrs. Cross. Cross was probably the wealthiest man in the Survey, very, very well-to-do, and he had a beautiful house up on Bancroft Place, and it was Cross who started the Petrologists' Club, about 1912. And the whole upper floor of his house, which was about four times the size of this room, was just lined with bookshelves, and he had probably the best personal library of any of the crowd in the city of Washington, and maybe in many places. Well it was Cross who started the Petrologists' Club, aided and abetted by others – Iddings was there then, Henry Washington, and of course out of, you know, I think the quantitative system first started way back in 1902-04. The evidences were still afloat at the meetings of the Petrologists' Club. So we met every month, up in Clarke's [Cross'] attic, we'll call it, and to me it was filled with pleasant memories. I'll mention only one item. Henry Washington liked his liquor, and he had been married, but he was unmarried at the time. Very close to Cross. Anyhow, it was established many times that he liked his liquor. He comes to the meeting of the Petrologists' Club, and something calls upon him to comment on something, and he always smoked cigars, and he delivered a very impassioned discussion of a paper, emphasizing it with his cigar. "Now I tell you! (thump)... You cannot simulate in a crucible (thump) what's out in the hills! (thump)..." And he'd come down (thump!) with his cigar... Well, the reason I draw on this, that this was a terribly funny episode, and Loughlin watched this thing, and Loughlin impersonated him at the next Pick & Hammer Show, perfectly – the most perfect impersonation. Well, I wanted simply to identify Cross with the Petrologists' Club and the quantitative system.

Now we come to E. O. Ulrich. He was 53. He had been married – I think he'd lost his wife – but he was a bachelor through most of his late life, and he married again late. Now I don't have to tell you, of course Ulrich was regarded as, you might say, the final word on everything concerning the Paleozoic of the whole, certainly the eastern U.S. The whole Mississippi Valley of course adored him, worshipped him; he was something of a tyrant, he could be very harsh, and contemptuous in discussions. The only thing that I will tie in my contact with Ulrich concerns the year 1930. I had been working out in the west, lead and zinc, Goodsprings [Nevada], so I had some notions from that country of what might be called structural control. Well, in 1930 Loughlin decided, he was head of the Metals Section, to put a man in the Appalachian lead-zinc. He got Lou Currier, and then told me that he wanted me to introduce Lou Currier into Appalachian lead and zinc. Well, I didn't know any history as far as Ulrich was concerned down there except that he was a stratigrapher and paleontologist. Well, of course this was Lou's job, I was just on the side; but anyhow, Lou gave a paper in which, you might say, following some of my notions, he said the breccias in which the ore occurred were tectonic breccias. And Ulrich rose like a shot lion, and he was utterly contemptuous, he said that those things had nothing to do with structure; they were collapse breccias, solution collapse. Well this was so sharp that somebody decided they would devote an evening of the Geological Society to the problem of the controls of the Tennessee-Virginia lead-zinc. And we had one good big bull session, about thirty-four or five. Now what I didn't know was that Joe Bridge, who was you might say a disciple of Ulrich's, had been working in there for several years on the stratigraphy. Joe came from Missouri. And he was one of the Mississippi-Missouri crowd that

idolized Ulrich. Well... It turned out that in this meeting which was a paper given by Currier on the one hand, me in the rear, the opposite by Currier with Ulrich in the rear. Well, it was quite a show... Some years later, Ulrich had died, I said to Joe, "Joe, did you ever see the light on those zinc deposits down there? You remember all that stuff back in the mid-thirties?" He says, "Foster, I *knew* you were right, but if I had ever admitted it, Ulrich would have killed me!"

Now we come to Hayes and Campbell; they were a pair, of course, 52. Hayes left in the summer of 1911 to go to Mexico. I scarcely knew Hayes. When I was appointed, it was my business to go and greet the Chief Geologist, which I did. But I did have a lot to do with Campbell in later years. Campbell was afflicted with asthma, and it greatly curtailed his activities in his late years. I should have told you about Ulrich – Ulrich only wrote 46 papers, but when we come to Hayes – Hayes wrote 97.

Now we pass on to Stanton. I can tell you quite a bit about Dr. Stanton. He was probably longer head of a section, the Section of Paleontology and Stratigraphy, than any other man. I happened to know him rather well because he was one of the first to visit me out in Wyoming. I won't get involved in reminiscence about that; 'twas a very funny episode; Mary and Dr. Stanton and a horse wrangler by the name of Burt Wilson and I spent a week in dry camp in the Big Horn basin and it was an awful lot of fun. Dr. Stanton was very moral; he was a pillar of the church. Burt was an utterly unscrupulous horse trader. And in the long summer evenings as we sat in camp there, Burt would spin out his horse-trading yarns, and Dr. Stanton very quietly said, "Mr. Wilson, when you've put over a deal like that, doesn't your conscience ever hurt you?" And he said "Look here Doc, I ain't never done nothin' to anybody that I wouldn't be willin' to have them do to me! Now if he won't stand what I will that's his lookout!" (Laughter.) Well... that's my passing compliment to Dr. Stanton.

Now we come to Lindgren. Lindgren was 50. I think in speaking of Lindgren I'll include Ransome. To me they were almost an incredible pair of men. The records of both of them in work and production were magnificent. Lindgren only wrote 205 papers, not to mention books; Ransome only wrote 103. But anyhow, the thing that I'd like to say (I knew Ransome much better in later years than I ever knew Lindgren); Lindgren's volume – I could give it to you in pages, or whatever, Professional Papers and Folios and so forth – but Lindgren's record by numbers of publication was about half of Ransome's. But Lindgren was the most prolific in ideas, and to me, and maybe you, Lindgren influenced thought for 30-40 years, and still does for that matter, through□ well I'll say work and vivid imagination, and industry. Ransome did not contribute much in the way of, I would say, ideas, but his work was to me, where I've crossed it, was fantastically accurate. And I would simply say the two were most extraordinary men, and yet, not quite alike. Ransome simply did his stuff with regularity... When I mention Ransome I think I ought to say this: In the old days – this is as of this period, 1910 – the Director got six thousand dollars, the Chief Geologist four, and the Geologists three thousand. Well, Ransome married, raised four kids, bought two houses, in 25 years, and yet, on three thousand dollars a year. Now, I might tell you a little story. First of all, he was a craftsman. He built a beautiful boat of mahogany, in his own backyard in Washington, and he used to take us down the river in it. When he came to California, Cal Tech, '26, he built another one down south. But the thing I'll mention about Ransome, first he was British born, and *very* British. I would say he was certainly, normally, unapproachable, very hard to approach. And he was like a lot of men who've become students of the art of expression, who are inclined to be sharp in comment, and Ransome's criticisms could be the sharpest things that I ever read. Now I think – of course as you probably know he died rather early, he died at

sixty-three or four, 1935 I guess it was, anyhow, I want to pay very high tribute to my benefits derived from Ransome.

Now we come to an amazing man, David White. He was 48. David White, up in New York, born in New York, went to Cornell, very quickly got interested in botany, and actually his first job on the Survey was drafting, drawing pictures of fossil plants. Well, I turned up in 1911 and somewhat quickly came in contact with Mr. White. The First War came along; White became Chief Geologist in 1912. The war started in Europe in '14. I might mention this, it might interest you, the war started for the Survey, the first war, in '17, the man who started it was W.O. Hotchkiss of Wisconsin. Hotchkiss was State Geologist and Hotchkiss thought there was a place for geologists during war. We were not yet in the war. That led to the creation of what became known as the War Minerals Committee. And on that committee were four men: Hotchkiss, representing the state geologists; a mining engineer from New York by the name of Westerfell; David White; and an economist from the Bureau of Mines named A.D. White. Now what the Survey did during that first war arose primarily out of that committee, which was formed in 1916; and there began my personal contact with Mr. White. I can string this out quite a bit, because I came to know him pretty well. First, he was one of the kindest men I ever knew; it was rare to see what might be called a stern look. He was a tall man, six feet two. In fact he always ran up the back stairs. He'd go to the museum, come over to the back stairs on the ground floor, and then run up; and that brought about the stroke that finally killed him. Well, the thing that I wanted to emphasize about David White – first he had an amazingly productive record. He only wrote 209 papers! The thing that I would emphasize was the man's versatility. He had a splendid mind, and while he was a paleobotanist, which most of us would regard as a specialty, he could turn to the various fields with almost brilliance, and I think that if our contribution to the war amounted to anything it arose out of David White. Let me mention, in the twelve years that David White was Chief Geologist, his door was never closed unless he had someone in there in a conference. And it was not uncommon for anybody down the fourth floor to go down to Mr. White's office and be received. Well of course that era's passed a long time ago; I go to Washington and it takes me three days to make a date with Bill Bradley.

But anyhow, this brings on another aspect of the war... the first war I'm talking about, of course... The war sneaked up on us, of course, '14-'15-'16, and we were drawn in, April 6, 1917. Well there was a lot of concern around the office about what a geologist did during the war, and we all met, oh, I don't know, three-four hundred, over in the museum building, and the topic was, "What does a geologist do in a war?" Well, Brooks had solved that problem, because Brooks, back, prior to '15-'16, they had established what were known as officers' training camps, in Fort Oglethorpe, Georgia. Brooks went to this camp with Sidney Paige, Harry Ferguson, and Fred Hunter. So when the war struck, Brooks knew exactly what he wanted to do, and he quit the Survey and went into the army and so forth; became a major, finally a lieutenant colonel. Now the reason I'm drawing on this is because the war had some very curious consequences. Because Lindgren had quit, Ransome was head of the Metals Section, and I would say a very effective man. At that meeting over in the museum, when called upon, Ransome said he didn't know what a geologist *could* do during the war except carry a musket. Well that had some fatal consequences, because George Otis and David White had a very definite notion about these things, and what they did, I'll have to say Mr. White did, was to carve out of Ransome's Metals Section all the ferrous metals, and it broke his heart. I don't know whether Adolph would agree with this – he knew Ransome much better than I – but from then on Ransome was a changed man toward the Survey. Because

first of all these ferrous metals were given to Burchard(?), for whom Ransome had a contempt, and of course what happened later was he first went to Arizona in '24 and then to Cal Tech. But I thought the war had some curious consequences like that. Incidentally that's where I got my initiation into manganese.

Well – I'm looking for a place to end this. I could talk about Vaughn. Vaughn's record of production 357 [papers], David White's was 209, F.W. Clarke 293. I'm reminded, looking at these figures; you've probably heard the old gag, the rooster walking around the barnyard, happened to bump into an ostrich egg. He went over and got the hen and he says, "Come over here – I'm not complaining but I just want to show you what other people are doing." (Laughter.)

Well, I could go on to Alden – here's a crop of seven of them that were all born in 1871 and therefore they were 39 in 1910. Alden, Alfred Brooks, Frank Hess, W.C. Mendenhall, Pardee, and George Otis Smith, and Arthur Spencer. I'll dwell briefly on George Otis Smith. [His grandson, George Irving Smith, was one of the younger Survey geologists in Hewett's audience at the time.] Born in '71, graduated from Colby College, Maine, went to Hopkins, came on the Survey. Frank knows a lot more about George Otis than I do. Well, he became Director at the age of 36. I came to know him through the war, and I might say post-war. He was kind enough to include me among those that he used to send his speeches. I'm not going to try to appraise the Directors for you, but I would rate George Otis very highly. He may not have been, I'll say, the breadth of a broad-gauge scientist, but he had what I would call first of all confidence, and maybe some vanity, but presence, and he was greatly in demand for giving talks around the country. He gave an average of four or five talks a year, and I recently had a stack that high. The reason I dwell on this is – he wrote every one of those speeches himself. And if you don't know it I'll tell you, that's not the custom in Washington today. (Laughter.) George Otis wrote every speech, and he was versatile, he had very strong and I think very high ideas about many things – the art of writing. He had ideas on a great many subjects. But anyhow, he wrote these speeches himself and then he'd send them around to four-six people to criticize. And it was my good fortune for the next ten years to become one of his critics, for which I was always very grateful. But, I won't go into the details, but I can tell you that a recent Director rarely wrote *any* speech that he gave. Now Mendenhall never gave but two speeches in 13 years he was Director. He was given a degree at the Colorado School of Mines, when he had to make a speech; next he was President of the Geological Society of America and he had to make a speech. And those were the only two times in 13 years that Mendenhall ever spoke outside.

I think I'd better taper this off. Now will you indulge me in just a few what I would call remarks in retrospect. Looking back, certainly pre-War and I would say pre-New Deal, the Survey has always been extremely, compared to [other] Federal bureaus, autonomous. I would say that certainly the years from '90 to 1930 the Survey was highly autonomous. And not until the New Deal came to town did they stick their fingers in the machinery. And brother, did they! If you've never heard it I'll tell you this. The New Deal came to town in '33, and straight through the Geologic Branch, no matter what you were doing, up till the arrival of Mr. Ickes, you stopped and did something else! Charles would remember some of this stuff. But that was fundamental. Why? They cut our appropriations and then to get money you had to go on hands and knees and get it from W.P.A.! And then they told you what to do. So that the autonomy began to pass as of the New Deal in '33. I'll let that pass; but anyhow we were *highly* autonomous in the old days. The Secretaries, of course I could draw on some of them, I knew some of them. I would rate Mr. Wilbur here as probably the best Secretary we've ever had. And he had one of the biggest asses afloat [??] in the

U.S., Hubert Work. He was a veterinarian from Pueblo, Colorado, and he was Secretary of the Interior under Harding. Oh, God! (Laughter.) The thing that I would emphasize in looking at this bunch of men is that they were I would say dedicated scientists and men with a high order of integrity. Maybe you can say, why he's just another old... he's showing signs of senility because he's just simply getting sloppy. But I would say if you take them for their work, their product, and their influence throughout the profession... I could draw on a number of things which – well, for instance: Of these 23 men whose names I have on the list here, 11 either were, or became, members of the National Academy. Let me refer to something else. You remember this American Men of Science? Started in 1907 by J. McKeen Cattell up at Columbia, and he quickly got the notion he wanted to know something about these varmints called scientists. So that you gave him the biographies and then he speculated as to what were the favorable grounds for the growth of these varmints. And then came the idea that they would star [\*] the eminent scientists. Well this had a whole lot of very funny consequences. But the thing that – I got interested in statistics back in the twenties, and as of the crop of men on the Survey, the geologists on the Survey, as of '10 to '20, in fact up to '30, forty-odd percent were always starred in American Men of Science. Well I take that as a measure of the esteem in which these men were held by their confreres.

Well now, maybe I ought to terminate this. What have we got now, we've got about 1200, haven't we, in the Geologic Division? Which is let's say roughly ten or more times what there were in 1920. Size is a terrible ordeal. I won't try to sketch to you how you grow in size, but size inevitably means diversification, and diversification means that, after all, contacts begin to shrink. You can't know more than so many people. I would pay high tribute to the intimacy that we had as a group there, when the personnel were 75 to 100, and I personally will pay high tribute for the benefits I derived from knowing, somewhat intimately, men in fifteen branches of the science. And that's very difficult these days, *very* difficult.

Now this may be the place to terminate these remarks, but you've been very indulgent. Now I'm going to ask Adolph to carry on with some reminiscences of his own. (Applause.)

### **Adolph Knopf**

I asked Charles Park what would interest this group. He had joined the Survey just twenty-five years after I did, so I suppose that he is in closer contact with this younger generation that surrounds me. He said, "You'd better talk about the philosophy that made these men tick," and he said, "*but don't talk more than five minutes!*" Well I said, "Philosophy is a rather heavy subject after a heavy dinner." But that five minutes began to work on me, the insistence with which he said, "Don't talk more than five minutes," so I'm going to get even on him – even if I have to talk twice that length of time! (Laughter.)

My first contact with the Survey was as a geologic aide on the Alaskan Division. I was ordered in nineteen hundred and five to join the party in Seattle. In Seattle we took along seven horses that had been acquired in Pendleton, Oregon. Those horses were shipped on, put aboard the steamer; they were unloaded at Skagway; they went over the railroad, over the Whitehorse Pass; they were loaded on a steamship, steamer, that went down the Yukon; and finally we were assembled at Dawson and headed for Alaska.

This was a very powerful contact with the Survey I had that first year; I don't know whether it was philosophical or not (laughter). But the first morning that we had camp, my chief who was Mr. Prindle, and there could hardly be a better chief than Mr. Prindle, awoke me at 4:15 in the morning

(laughter), and this I thought was a mistake, but I found out it was not a mistake, because that was the routine the rest of the season. That was not the only surprise I got. We had hardly got on the road, when Mr. Prindle spied an outcrop across on the other side of a river. And all Alaskan rivers are ice-cold, 32 Fahrenheit. Mr. Prindle went in and walked across and he sampled that outcrop and I looked rather dubiously on one side. But that really was putting into practical effect one of the principles that Professor Lawson used to try out on us – when you see an outcrop, go up to it and examine it! And that was Prindle’s idea even if there was a stream of cold water between you and the outcrop.

Well, in those days of course I was rather inclined to hero worship, and I thought that everything that Mr. Prindle did was perfect. There was only one idea that he couldn’t put into my head. You see in Alaska you’re generally wet and cold, all day long, and Mr. Prindle asserted to me, in our camp, in our tent, that the way to do was to sleep in those wet clothes and dry ‘em out overnight. I said, “Mr. Prindle, I’d rather sleep dry and pull on those wet clothes in the morning and watch them steam as I put them on.” (Laughter).

The next season I was attached as a geologist to a topographic party that worked in the Matanuska Valley in southeastern Alaska. The chief was Mr. Jurdine, who later became the chief topographer of the Pacific Section. I had seen in the previous summer the dedication of the geologists to their work; this summer I saw the dedication of the topographers. The way they worked was, as we moved into the interior of Alaska, camp was established, Jurdine looked around for the highest peak anywhere around, and the next day he would climb to the summit of it with his instrument. He had as an assistant a large, burly senior from the University of Washington named Bill MacDonald, and Bill had to carry up the transit, and when they got to the summit of the peak, they’d put on warmer clothes, and Bill had to sit there all day long, recording the observations of his chief. Well, when we got back to the coast in September, in the camp there, at sea level, Bill got up one morning, looked at the scenery, and said “A beautiful morning – not a peak in sight!” (Laughter).

From there, at the close of the field season, I had that year become a permanent member of the Survey – nineteen hundred and six. In the fall I went to Washington, and to me, Washington was a very wonderful place; everything was very remarkable, interesting. I had hardly been there a short time before I was made a “Pick”. And I well remember the first meeting of the Picks that I attended. At that time they met – well this meeting was at the house of Philip Smith in Cleveland Park, in the parlor. There were about thirty or forty Picks present and they were a very lively and argumentative bunch. And after the scientific session, the hostess would have refreshments prepared for them, but it was strictly on the card that she should not show herself. (Though we had sometimes heard that she would like to.)

At that time the organization was not called Pick and Hammer, because there were two organizations□ one of the younger geologists, which had been actually founded by Alfred Brooks and five other younger members of the Survey in ‘95. And then in imitation of that group there was founded the Hammers. And only occasionally did the two of them meet together, on special occasions. I remember one such occasion when they introduced and made an honorary member of the famous German geologist Penck. He was escorted in; he had on a dress shirt, a white front, and somebody had drawn in charcoal the Pick and Hammer symbol on it, and he was received with great applause by the Picks and Hammers.

Well, the Alaskan Division in those days consisted of ten or eleven men on the geologic staff – ten or eleven, and of course we were all very closely housed together, so that we knew each other, and

we had a very strong esprit de corps, very strong, partly due to our general loyalty to the chief, who was Alfred H. Brooks, who was an admirable chief; and the Director, George Otis Smith, often cited the Alaskan Division as an example to the rest of the Survey – he'd like to see the rest of the Survey have the same degree of esprit de corps.

After my sixth season on the Alaskan Division - and I might say that in those six seasons I never had a field assistant - Mr. Lindgren at that time asked that I be transferred to his section – this was in 1911 - so I was transferred to Mr. Lindgren's section. He was then both - I guess it was about that time he became Chief Geologist, and also retained his chieftainship of the Section of Metalliferous Deposits. There were only ten men in that section, too; one of them was – well, there was Graton, who later went to Harvard, and there was Bill Emmons – were the most distinguished of that group. Bill Emmons was the one who caused great joy from the fact that he was seen one day looking at his own report. As you all know who have written Survey reports, by the time they come out, you're really sick of them! (Laughter.) But Bill had recovered and he was looking at his book, and enthusiastically thumbing the pages, and saying, "Damn good stuff! Damn good stuff!" And this struck a really responsive chord in all the rest of us! I now have a report in the Survey that's been in there about 18 months and I don't know where it is now... But in those days – well, take Mr. Ransome, that you were speaking of – when I handed in the manuscript of Professional Paper 110 [A geologic reconnaissance of the Inyo Range and the eastern slope of the southern Sierra Nevada, California, 130 p.], Mr. Ransome brought it back within three days, to me, and it was much more rapidly processed than it is today.

The Metalliferous Section was – we were on the third floor, and there was a row of us, very closely spaced. Toward the end of the row there was the office of Arthur Spencer, and of J.B. Umpleby, and my office was way in the extreme end; I had to pass through Umpleby's office to get in there. Well we always began the day's session with a bull session of about a half hour, a discussion of geologic problems. One of them that interested us at that time very much was how to get absolute proof for the addition of substance to rocks during contact metamorphism. Well, one thing I learned by these bull sessions was that when you finally needed a crucial, convincing argument you went up to the bookshelf and pulled down one of your own publications and there was the answer! (Laughter.)

One of the ever-recurring problems on the Survey – or gripes is the word – on the Survey at that time, in those years, say 1910 to 1920, was the low salaries. And to my surprise, I was asked to make an exploratory survey of salaries in the universities along the Atlantic seaboard. This was under the auspices of the Survey and the Civil Service Commission. And I went from MIT and Harvard on the north to Johns Hopkins on the south, and I found out a great many facts... which I will not mention tonight... But one of them was that the salaries at the universities were somewhat more generous than those of the Survey. And that of course was really the purpose of this investigation. (Laughter.) I found out as one of the – I was looking over my notes today; it's very interesting in the light of what's happened since – the highest salaries paid were at Harvard. And the maximum salary that any full professor received was fifty-five hundred dollars. There was a remark in my notes that Professor Daly, who as all of you know was probably the most distinguished geologist at Harvard – and it turned out that the head of the department was really no more powerful than any other member of the department; he was merely the liaison officer between the department and the president.

Well, during those years we were always glad when somebody was appointed to a university or another position, for instance, Lindgren went to MIT, Graton went to Harvard, Bill Emmons went to Minnesota, many others went to oil companies. However there was a danger there that the Survey might suffer what Dean Park has brilliantly called “residual impoverishment.” And as a matter of fact this was the theme of many a Pick and Hammer song addressed toward the administration. In the course of time, however, as you know, things have changed for the better, and now the Survey salaries are higher than the universities, and there is a “return flow.” I’ll mention some of the return flow – the first was Lovering, then there was Gilluly, and then there was Philip [Arthur A.?] Baker, and that’s only a few of them, just to mention. And so I hope the Survey is now, instead of suffering residual impoverishment, is getting supergene enrichment, which means enrichment from the top down... I think that’ll do for me (applause).

### **Frank C. Calkins**

I’m not going to preach a sermon, but there’s something from the Scripture that runs in my head that I might take as a text: “I have been young, and am now old.” (Laughter.) You can see that I’m now old, and perhaps you can take my word for it that I was once young. And I’m going to give a few rambling, disorganized reminiscences that spread through, well, a quarter of my life. The first one came when I was fifteen years old, and I’m going to take my cutoff point as 1914 – you have to stop somewhere. I shan’t say much of anything about anyone now living – some but not very much about Wrather, for a reason that will appear in time.

The earliest reminiscence that I have in mind came in 1893, when I was taken into a rented house that David Day had taken in Chicago, not very far from the World’s Fair grounds, because he was in charge of the mineral exhibits there. And Major Powell was staying in the house at the same time, and I saw him occasionally, sat at the same dinner table with him once or twice. I have a vivid recollection of him, and I remember particularly the way he looked at a person to whom he was talking. He never talked to me but he talked to a lot of people, and he half closed his eyes and looked very directly and intently and spoke quite deliberately, seemed to be very careful to make sure that what he said got across, and was understood.

Well, that’s the first Director of the Survey that I ever saw; he was Director then. I didn’t enter the Survey until some years later, and it was at the suggestion of David Day, by the way, who was a cousin of my mother. But he was the second Director, and so I have seen all of them except the very first, Clarence King. And even my oldest friend, Arthur Spencer, God bless him, never saw Clarence King, although he once wrote a letter to him, which King didn’t answer because he was an invalid at the time.

Well, I had pretty close relations with two later Directors, who’ll come up in turn. I entered on my first work as a field assistant, though not a (excuse me for correcting you, Foster, perhaps I shouldn’t do it, because I didn’t become a permanent employee until later), at any rate, in 1900 I went to Ellensburg, and on a beautiful day toward the end of April I was met at the station by George Otis Smith, and I remember very well how he looked, how I was impressed by his handsome appearance and his kindness and his air of authority, all combined, and I remember too that in the cool of the evening on the same day he gave me a little filling in on the geology of the region. He had, in the previous year, finished with Mendenhall mapping the geology of Mt. Stewart quadrangle, and Mt. Stewart stood up high on the skyline. I can see it all yet – you remember some of those far-off things better than you do things that happened yesterday. Well, I was assistant to George Otis for three seasons. We mapped the thirty-minute Ellensburg quadrangle in one

season□ one doesn't do those things nowadays, and of course what we did at that rate of speed all has to be done over again, and perhaps more than once. But at any rate we roughed it out. And then the next year was perhaps one of the most adventurous that I ever had. We were given the job of, oh, nominally, of checking up on the condition of the monuments along the 49th parallel. They'd been put there, oh, I think about sixty years before, and that was ostensibly what we went up there for, but we incidentally did some geological reconnaissance. A good deal of our route was without trails, but it so happened that the part without trails was rather better going than one of the trails that we went over for a good many miles. It was called the goat trail, appropriately, and one part of it, I guess it was a stretch about as long as this room, and it consisted of two or three planks, overlapping, about 18 inches wide and maybe a couple of inches thick, and they were suspended by wire cables from iron pins driven into a slightly overhanging granite cliff, and the Skagit River was boiling along thirty feet or so below us.

Well, we didn't check all the monuments on the stretch assigned to us; there was one part of it that would have been practically impossible to get to in the time we had, and George Otis was realistic about what we could do in a given time, so we bypassed them. One little thing that I remember is that I first saw Daly there. I was going along a trail west of the Cascades, in heavily wooded country, looking for a boundary monument. This trail went along a rushing stream, and presently I caught sight of a big man with auburn whiskers or a full-grown beard, standing on a big boulder in the midst of the stream, and that was Reginald Daly, and we had a little conversation.

Then the next year, 1902, we did perhaps more than half of the Snoqualmie quadrangle, which was another thirty-minute one, with very complicated geology, and I guess everything considered – you have to consider everything in jobs like that – we did it pretty well. At least Aaron Waters, who has reviewed a lot of our work, said it was pretty good, considering. (Laughter.)

Well, Foster has expressed his admiration of George Otis Smith and I don't know that I have anything more to add than what is rather superficial... He had a personality that counted, that was impressive, not at all pretentious, but he had the look and manner of a leader, he always knew he was boss, and you always knew he was around when he was around, and you were glad of it.

This brings me to remark on a difference in custom in the use of names. In those days, people very seldom used first names unless they were very well acquainted, and I'm referring to George Otis Smith as "George Otis," a lot of people did, and they sometimes addressed him as "George Otis," but I do not remember anyone ever addressing him as plain "George," and he never called me anything but "Calkins," and I never called him anything but "Mister Smith." That was customary; you used "Mister" for a person older and of higher rank. The term "Doctor" was seldom used; there was nobody who said, "Call me Doctor," and more people that said "Don't." Well, the change of custom was very readily brought home to me just about a week ago, when on leaving the office I ran into George I. Smith, George Otis's grandson, and his little son Randy, just short of four years old and George Otis's great-grandson. And Randy without any prompting looked at me and said "Hello, Frank!" (Laughter.) And so it is. I mean, children are allowed or encouraged to do that and I am continually greeted as "Hello Frank" now by people whose own names I'm not sure of. I'm unhappy about confessing that, but I'm hard of hearing and my memory isn't what it used to be and never was. Well, but there's something to be said perhaps on both sides of that. There may have been some advantages in recognizing differences of age and rank in the old-fashioned way, but I must say I enjoy the new way. I don't know whether I would say it makes me feel younger – I think perhaps it's the other way around – because I'm being

called Frank in my old age a great deal oftener than I was in my youth; perhaps if I were called “Mr. Calkins” it might make me feel younger. Well I’m rather quibbling on that...

In the Snoqualmie quadrangle I first became acquainted with a man who was in the field with me more seasons than anybody else. His name was Donald Francis MacDonald. He was from Nova Scotia, and he’d somehow gotten into the employ of the Hudson’s Bay Company, and had been a benefactor. He was in charge of the company store up on the Stiking River in western Canada, and he saw before very long that there wasn’t any particular future in that, and he somehow got down to Seattle, and got into the University, got interested in geology, and he got a job with us in that year 1902 as a packer. He was in parties of mine after that for almost every year for about five years; I know he was in 1907, and thereby hangs a tale, which I’ll come to presently. Well, “Old MacDonald” was a very estimable character and we gave him geologic chores to do at the very first, and more and more as time went on. In 1907 his title was changed to field assistant or assistant geologist. Well he went on and in the course of time he became geologist of the Panama Canal Commission, and did other things, and was very successful on the whole. He was a big man, and strongly built, not at all the muscle-flexing type, but in between seasons he went to George Washington University, and to keep himself in trim he went in for wrestling. He came to me one morning with an air of something like wonder on his face, and he said the night before he had a match with a policeman who was regarded as the amateur heavyweight champion wrestler of Washington. And he said, “By Jove, I threw him!” Mac never used any expletive stronger than “By Jove!” but he used that rather frequently, and it always came at the climax of any little story he was telling.

The next thing was the Coeur d’Alene district, and I was supposed to be assisting Ransome there, but Ransome was grabbed by Lindgren to work with him in the Cripple Creek district; that was considered very, very urgent. And so Ransome didn’t come into the Coeur d’Alene until nineteen hundred and four, when he did the mining geology and I went on with the general geology, and something that helped us to get acquainted was we found we had some similar tastes in literature. For example he didn’t consider it ridiculous that I had with me one of a three-volume set of Shakespeare’s plays, which my sister had given me; it’s a small edition on thin paper. Also he was fond of Boswell’s Life of Jonson, and he knew about the works of George Borrow, which I bet very few of you do, and it was brought out in a more subtle way when I asked him – the mountain ash was full of red berries at that time, and I asked him whether the mountain ash was the same thing that the Scotch called the rowan. He said, “Yes, those are the berries that Babbie had in her hair.” Well – I don’t know how many of you know what *that* means – Babbie was the heroine of a novel by James Barrie, “The Little Minister,” which a good many people would recently have read at that time, and he... Well, he not only had a taste in literature, but he wanted his own writings to have literary quality, and he was not content to have them merely clear, but he didn’t mind having a bit of elegance in them now and then. And I can remember as if it were yesterday his looking over the galley proofs of his Professional Paper on the Bisbee quadrangle in Arizona [USGS Prof. Paper 21, 1904], when they came to camp, and he looked over them this Sunday morning and he came upon a passage which he had written like this – I say he wrote it like this because this is the way it is in the printed report – “Once each year, just after the summer rains, the country awakes for a brief period from its long drought into a belated spring. Grasses wave over many of the hill slopes, and gay-colored flowers nod among the rocks.” Well, that had been toned down by an assistant editor named [unintelligible] whom Foster remembers in a pleasanter light than I do, and he had – I’m pretty sure about this – he had made it, where “Grasses wave over many of the hill

slopes,” he had it “Grass grows on many of the hill slopes,” and where “gay-colored flowers nod among the rocks,” he had put “and flowers appear among the rocks.” (Laughter.) Well, I can see Ransome firmly penciling his comeback on the margin: “STET!” – underlined. “Grasses *do* wave, and flowers *do* nod, and these changes completely destroy the flow and balance of this sentence.” (Laughter and applause.)

Well, let’s see... The Philipsburg was the next, and there Bill Emmons did the economic geology during nineteen hundred and six while I did the general geology in six-seven-and-eight. I don’t know if I need to say anything about Bill Emmons; all of you or many of you must know his reputation at any rate and oh, he looked like the sort of a person he really was – a stocky, well-proportioned figure and a ruddy face and a kind of a slow laugh that was very expressive of him and came rather frequently. I’ve said some things about him in a memorial that Foster wrote.

Well in nineteen hundred and seven, MacDonald was along all the time, MacDonald was – I know he was a packer in 1907, because Wrather was listed on the payroll as assistant packer – and there’s my second Director. I don’t know that I need to say anything in particular about Wrather in the field, but it was forty-one years after that when I turned 70 and retired for the first time – they had a little ceremony, if you want to call it that, in the Director’s room, and Wrather was Director at the time, had been for a few years, and he produced a letter which I had written to him in answer to his application for a job, and I was extremely careful to tell him just what he had to expect, not to arouse any false hopes, and I told him he would have to pay his fare to and from the field, and he would get subsistence in camp, and a certain monthly wage, which I’m sure was microscopic. And when Wrather read it aloud to the company, I could see that there was a sort of unconscious humor in it, that is perhaps one of the reasons why he kept it, because he probably didn’t foresee when he began to keep it that he was going to be Director.

Next I’ll jump to 1910, when I had one of the three parties, all of which were under Gale, examining land grants – land grant territory, to see how much of it we could call mineral, and get it away from the Northern Pacific Railroad. And Loughlin came to me then, as field assistant. He had previously worked in the east under Gregory, but that was his first western work. He was something of a – well – oh, superficially a tenderfoot; for instance he told me one day how he had followed a path, down a brook, until he came to a cottage on a small farm. Well of course in western language he followed a *trail* down a *crick* until he got to a *cabin* on a small *ranch*. But he adapted himself perfectly well, and did very good work, and he was very much liked by the camp hands; he told stories around the campfire; I remember his telling in particular with some pantomime about a scene in Don Giovanni, where he perhaps carried a spear as a super, of Edouard de Reszke, waltzing around with a very small tenor, whom he kept off the ground part of the time.

In Washington, I became really more friendly with Loughlin than I ever did with any administrative officer while he was administrating, and we both had an interest in music, which he knew enormously more about than I did; he had thought of being a professional musician at one time, played the flute very well, and he played the piano pretty well; it was a great treat to hear him improvise, somewhat in the way that Alec Templeton used to do much later, if you’ve ever heard of him – Alec Templeton was blind... And then Loughlin was the leading spirit in the Pick and Hammer shows; I think he was mainly responsible for the crystallizing of the shows from their isolated skits at an annual dinner. He had all the talents that could be put to work in a show; he used to direct the chorus, and write his fair share of the doggerel, and he always was, for many years, the leading actor; he always impersonated one or more people, and it was rather a distinction

to be impersonated by Loughlin, you had to be rather prominent to make it worthwhile. Well he kept that up until he became Chief Geologist; and perhaps the year before that, he gave a triple performance – well, he impersonated three people, and they required very different makeup, especially in respect of what they call theatrical hair. One of them was Mendie, who was bald, there wasn't any additional hair necessary there, he was bald and Loughlin was bald, but the shapes of their heads were very different – Loughlin had a regularly dome-shaped head, but Mendenhall had a sort of a high crest along the top of his head, and so in that part Loughlin had what they called a bald-headed wig (laughter). And of course it had to be shaped in just the right way, and I think it may have been rather a special job to get it up. And Mendenhall being very much taller than Loughlin, why, Loughlin wore shoes with soles about so thick. Then he also impersonated Mrs. Fowler (laughter) – that was a very different look - Mrs. Fowler had a very abundant full-length head of hair, dark brown, and Loughlin had that kind of a wig, and he made use of it: Mrs. Fowler had a way of putting her hands back and adjusting the knot, when she felt that it was slipping a little out of place; and she did that about so often, and Loughlin did it, probably a little more often. That was a part of his technique, to catch some mannerism that identified the person to anybody who often saw him. Well then there was one more, he was a German geologist whose name I haven't been able to recall; he was an expert on waste, on desert wastes, and he had a shaggy head of grizzled hair and a beard to match, and Loughlin probably found the right wig and false beard in stock, and this German was a good sport, and he was perfectly delighted at the resemblance, and I'm quite sure that Loughlin imitated his accent also, and he showed his delight by springing up in the middle of the audience where he was seated, and he said "See - *here* am I, and *zere* am I, up on ze stage!"

Well, I won't say anything about Loughlin as an administrator or as a geologist, I think he'd rate very high as both. His personality was rather understated, the opposite might be said of George Otis Smith, for instance; I think people sometimes *didn't* know Loughlin was there, and didn't appreciate him as much perhaps as he deserved to be.

Now I go to the Yosemite Valley, where I went with "Mattes" [Matthes] in 1913, and I perhaps ought to apologize for pronouncing Matthes' name the way he did – most people think that t-h spells "th," and that was a sound that he simply could not have made. He thought he could pronounce the t-h sound in "this" (he really didn't very well), but he didn't pretend to be able to pronounce the t-h in "thin." Well, that's a very trivial matter... Matthes, as you all know, was one of the most skillful topographers that we ever had, that is, the most skilled in contour mapping, but he was a somewhat philosophical topographer, you might say. What I mean is that he got interested in the meaning of the forms he was contouring, and he had a doctrine that you should be sure to show, and might perhaps exaggerate a little, what he called the "index forms" – the U-shaped profile of a valley, for instance, or the forms that are due to jointing. He was a geologist, and he became more and more of one, and a turning point came in 1913. He had made the Yosemite Valley map on a scale of 1:24,000, one of the finest pieces of work the Topographic Branch ever did – but erring a little bit by overinterpretation in places, as they had occasion to find out when they were doing the work all over again, making a map based on air photos. But there he was, assigned the job of mapping the glacial deposits and interpreting the geologic history of the Yosemite Valley and the adjacent parts of the High Sierra, where the glaciers began. And he did, as many of you know, a wonderful piece of work there; he was rather long in getting the report out, because he cared very much about how it was written. He was very much aware that writing is an art, that merely throwing facts on paper isn't enough, that facts are dead unless you get them

understood, and you're more likely to get them understood if you state them in an interesting way, and he constantly had in mind the sort of people that he hoped would read his paper; of course they would be people of a rather high order of intelligence, there wasn't any cheap popularizing or talking down about his writing. But he produced what is surely one of the classics of geology in Professional Paper 160 [Geologic history of the Yosemite Valley, 1930].

He had a very interesting personality that distinguished him in every sense of the word. He had a rather an aristocratic bearing and he carried his head high, and I can't imitate him exactly, but he had a way of holding his head so that when he talked to a person two or three inches taller than himself he'd seem to be looking over his head. He was rather proud of his ancestry, it came out now and then – his mother's name was – it was mostly his mother's line that he was proud of – and her name was Susannah Johanna Rondedus Debilla [??].

I skipped one man that belongs with Philipsburg, and that's Joseph Pardee. It was in nineteen hundred and eight at the beginning of the season, and I was in some building in Philipsburg, and a man came in, a distinguished looking man, he was then about 37 years old, with his wife, and a beautiful little girl, about three perhaps, and asked what the chances were of his getting a job. Well, he told me something about his background; he'd been through the University of California, had no post-graduate training, and in the several years that had passed since then he had had to make a living in one way and another, and had never had a chance to do the sort of work that in his heart he knew he wanted to do, and that was geology. Well, I said I thought it could be arranged, and it was – I managed it by telegram – and so he assisted me during that season, and he went on and on and... One thing that he did was to get into work on the western phosphate deposits in association with McKelvey, and McKelvey says that he was way ahead of his time in his thought about the origin of those deposits; that he formulated ideas that are pretty close to those that are generally accepted today. Then there's another, more dramatic feature of his work. The very first paper he published was about the dim terraces that are visible on the slopes of the Missoula Valley, and he saw that those were left by a lake, which he called Lake Missoula, and he worked from time to time on the traces of that lake, and it was the subject of a paper in the GSA Bulletin, and also the subject of his presidential address before the Geological Society of Washington.

Well, I've had I think a lot of luck in being associated with distinguished men, but I don't know that I can take any credit for that, for getting Pardee into the Survey, but it seems a particularly lucky chance that he... "Knock, and it shall be opened unto you," and he knocked, and I happened to be there to open the door. (Applause.)

### **Brief Biographical Notes**

**Donnel Foster Hewett** (from a Memorial by Richard H. Jahns)

Born June 24, 1881, in Irwin, Penn., son of a coal-mine engineer. College preparation at Georgia Tech. Hired by USGS in 1895 to oversee USGS mineral exhibit at 1895 Atlanta Exposition. Graduated from Lehigh University in 1902 with a major in mining engineering. 1903–09, Pittsburgh Testing Laboratory, made short visits to many mineral prospects in the U.S., Canada, Mexico, Europe, and South America; notably the vanadium occurrence at Mina Ragra, Peru. January 1909, married Mary Amelia Hamilton of Pennsylvania. 1909–11, Yale University; Ph.D. in 1924. June 1911, joined USGS. Perhaps best known for lifelong studies of manganese deposits and mineralogy, quadrangle mapping in southern Nevada and adjacent California, encouragement and facilitation of graduate student mapping in Mojave Desert, consultation on

Mojave Borate Project, and major role in development of the Mountain Pass (Calif.) rare-earth deposit. Less widely recognized is his leadership in the Survey's strategic minerals program of World War II, which was probably the trigger that set off the tremendous expansion of the organization in the next 30 years, starting with the uranium program that began in the late 1940s. Continued employment with USGS long after reaching statutory retirement age of 70 in 1951. Died Feb. 5, 1971, in Menlo Park.

**Adolph Knopf** (from a Memorial by Charles F. Park, Jr.)

Born Dec. 2, 1882, in San Francisco, Calif., son of a rancher. Graduated from the University of California in 1904, M.S. 1905, Ph.D. 1909. 1906, joined USGS, permanent until 1920, then part-time until his death. January 1908, married Agnes Burchard Dillon of Washington, D.C.; four children; Mrs. Knopf died Nov. 16, 1918. 1920, married Eleanora Frances Bliss, a structural petrologist. 1920, began teaching career at Yale; 1951, retired from Yale and moved to Stanford as a Visiting Professor. [Gave the first lecture of the Peninsula Geological Society.] Well known for studies of pyrometamorphic ores, Seward Peninsula tin deposits, Mother Lode region and Inyo Range in California, Pioche and Yerington districts of Nevada, Helena district and Boulder batholith (or bathylith as he spelled it) of Montana, igneous petrology, geochronology, textbook in physical geology (with C.R. Longwell and R.F. Flint); and for his scores of students who went on to successful careers of their own. Died Nov. 23, 1966, in Woodside, Calif.

**Frank Cathcart Calkins** (from a Memorial by Max D. Crittenden, Jr.)

Born June 7, 1878, in East Rockport, Ohio, son of a U.S. Navy coastal surveyor and historian. Early education in France. Graduated from the University of California in 1899. April 1900, joined USGS, with which he served full-time until 1948 (age 70) and then as an annuitant until 1969. Field studies included Ellensburg and Snoqualmie quadrangles, Wash.; Coeur d'Alene district and Mullen and St. Joe-Clearwater area, Idaho; Philipsburg district, Mont.; Cottonwood-American Fork area, Utah; and perhaps most notably, the Yosemite Valley of California. During World War II was led into a new but related career as scientific critic and editor; it became an honor (as well as, usually, a painful experience) for a Survey author to have his report "Calkinized." Died in 1974, in Palo Alto, Calif.