

Report ca 1915

Lake City Cal.

Feb. 17, 1915.

Dear Prof. Church +

This storm has stopped measuring again. Was going to Emerald Bay yesterday from Falles. But this storm seemed to be a bad one, so thought might just as well go on to Lake City and measure up from this end. Will have to measure Lake City first to get the percentages of this side. Is snowing very hard now.

Emma (his wife) and the cat behaved very well this trip. Didn't even get sick, although was very rough coming home. Wind from Lonely Gulch and Meigs Bay would hold the boat way over on one side. Was a regular gale; picked the water up in sheets. The tender is a dandy for this work and tows very easy-----

[ A. S. Smith ]

AKBAR

Memorandum on Meteorology

7. Snow Studies —

Necessity for the large motor boat.

Without it, the work must have been greatly hindered or stopped, for the circuit of the Lake can not be made in winter in an ordinary boat.

See extract from letter of February 18.

Project at Lake is now solving the very problem raised by Professor Henry of U. S. Weather Bureau { Can snow be accurately surveyed? Can the evaporation <sup>loss</sup> of snow be determined? }

Purpose of investigation is to determine an exact and economical method of surveying large areas of snow at high elevations so as to establish a method of forecasting <sup>seasonal</sup> water supply in the main agricultural basins of the State. The rate of evaporation is also being determined, so that this uncertainty can be eliminated. The following table presents the results of the survey of Lake Tahoe to date.

The extract from the letter shows the

irregularity of precipitation over the basin and the necessity of an exact knowledge of such irregularities to assure accuracy in forecasts.

Service that can be rendered the State  
at <sup>Not only</sup> a slight additional cost:

Seasonal forecasts for - - - { Pleasant Valley (Mt. Rose courses)  
Reno and Fallon (Lake Tahoe Basin)  
Virginia City (Marlette Lake)  
Humboldt Basin (Ruby Mts.)

Virginia City can be provided for at no additional cost by having Mr. Smith climb the ridge from Lake Tahoe or the keeper at Marlette Lake will do the work, if furnished a snow sampler.

The Humboldt Basin would require a special trip to the Ruby Mountains once a year at a maximum expense of \$150. After the courses were laid out, the Weather Bureau could probably be persuaded to assume the task and even to bear the initial expense.

At least Mr. Alciatore, Section Director has offered to recommend the plan.

Reports already requested by Reclamation Service, Power Company, and ranchers in

Truckee Meadows; numerous queries from citizens

Service to Inter-Mountain Region

Idaho has just completed a thorough investigation of the Duty of Water, thus relieving Utah and Nevada of necessity for continuing the work.

Nevada by natural situation, equipment, and work already done, is in a position to complete the investigation of the Snow Resources: Their Improvement and Seasonal Forecasting.

If need be, this work can be completed, <sup>above</sup> the slowly, by Mr. Smith, with ~~slight~~ <sup>occasional</sup> assistance.

AKBAR

2 - Professor Fergusson and Agricultural Meteorology -

Apart from his service in designing and constructing instruments for the Snow Studies, and acting as general adviser, Professor Fergusson has conducted the investigation of the possibility of forecasting frost from Mountain Tops which furnished the <sup>chief</sup> motive for establishing the automatic observatory on Mount Rose.

Owing to natural difficulties, the obtaining of satisfactory records has been delayed until the present time. However, bulletins are now being prepared. A further advancement in this work is expected when an improved meteorograph now approaching completion is installed. This instrument will tend to eliminate the time error due to the sketching of the record sheet.

Agricultural Meteorology

The U. S. Weather Bureau is too engrossed with general problems, such as forecasting, to push investigation along lines useful

to agriculture and irrigations

Although Professor Fergusson is a pure meteorologist, his broader training, particularly in Mountain Meteorology, fits him to handle practical problems more successfully than the routine meteorologist.

Problems of immediate importance are

1. The continuance of the Temperature Survey
2. Improvements in Local Forecasting of Intensity of Frost
3. The Length of and Heat Units in the Growing Season

The temperature survey of the Inveree Meadows now practically completed, indicates that the problem of frost is not a serious one on the uplands where general farming is usual. This survey should be extended in cooperation with the horticultural survey and particularly with the survey for underground waters. The series of recording instruments employed, thus assuring the record of temperature for every hour in the day, affords data impossible with the ordinary thermometers - equipment - employed by the Weather Bureau.

A very complete meteorological station for obtaining delicate measurements of weather phenomena is now nearly completed at the University at Professor Fergusson's personal

expense. This will be valuable in improving present methods of forecasting the amount of frost to expect under varying degrees of cloudiness and wind.

A large meteorological library also has been obtained practically without expense to the University.

### Teaching -

An elective course in meteorology has been given to agricultural students and was requested again this year by two.

### Designing and Constructing Instruments

There has been a steady increase in requests for assistance in designing instruments and laboratory apparatus, which Professor Ferguson is fitted by long experience and skill to render.

Professor Ferguson accepted position in university only under promise of permanency.

The years 1906-08 were spent waiting in vain for Shant & Mason Co. to make a long-range thermobarograph for Mount Rose Observatory.

Upon advice of Professor A. G. McAdie, who suggested Professor Ferguson of Blue Hill Observatory as the only man he knew who could fill the contract, the latter was persuaded to undertake the construction of the desired instrument. Soon two additional instruments for base stations were authorized. Professor Ferguson had already designed a meteorograph for Harvard University for use on El Misti, Peru, 19000 feet in altitude, and had, furthermore, been interested in the study of mountain meteorology on Mount Washington, New Hampshire. Owing to difficulties in adapting the new instruments to the wild winter conditions on Mount Rose, he was invited West in 1909 for a brief trip and then again for a year's stay in 1910, with the view to remaining permanently.

In the spring of 1911, he was impelled by the uncertainty <sup>due</sup> regarding the attitude of legislatures toward state universities and by the hardships



of mountaineering to return to Blue Hill Observatory, where tranquillity and permanency were assured and personal inducements were offered by the Director, Professor Roach. It was only upon the promise of myself that he would be relieved of the strenuous mountain work and the positive assurance of President Stubbs that his position would be as permanent as his own or mine, that he consented to remain. As a further promise and assurance, the College department of Meteorology was created and he was appointed Professor of Meteorology with initial salary of \$1800, I believe, to be increased \$200 a year(?) until it finally reached the regular salary.

Since there were very few such positions in the United States, Professor Ferguson staked his future on the pledge of President Stubbs.

When in 1912-13, the Board of Regents was endeavoring to make adjustments in the Faculty, and through Acting President Teners suggested that I devote my time exclusively to meteorology or Latin and so dispense with Professor Ferguson or Professor Thompson, I immediately replied that

in such an event, I must take the Latin, for Professor Ferguson had been promised a permanent position.

Owing to the death of Director Roach and the consequent shrinkage in funds to support Blue Hill Observatory, there is at present no position available there and the bitter, though concealed, rivalry between the U.S. Weather Bureau and Blue Hill Observatory precludes the probability of obtaining a worthy position ~~under the~~ <sup>Government.</sup> The only alternative, therefore, is to engage in commercial work or emigrate to South America.

That there is reputation to be gained by the University in maintaining the work in meteorology is evident from the ideal situation of Mount Rose Observatory and the welcome it has already received in this country and abroad. On the other hand, Professor Ferguson because of his mechanical ability can maintain the department at maximum efficiency and minimum expense. Furthermore, so long as financial emergencies require, he is willing to accept reduced compensation supplementing such deficiency when necessary by designing during his leisure hours. This he offers

to do, if thereby he can devote himself in tranquillity to his life's work.

The Time So Far Spent on both projects is five years, if allowance be made for the seasons when the work lay dormant or was conducted only at the week end.

The Private Observatory was established June 1905.

### Project I. Frost Forecasting

Partial Records, small thermograph 1905-07.

Observatory Building constructed autumn 1906.

Preliminary Bulletin 1908.

Ferguson Meteorog. purchased 1909 but not working until 1910.

owing to ~~the~~ insufficiency of funds project suspended 1909-10.

Professor Ferguson appointed 1910-

Base Stations first established 1910-11.

Work regularly pursued since 1910.

### Project II. - Snow Resources

Casual private trips with camera 1905-06.

Detailed full time on Snow Studies 1908-10.

Sampler invented 1909.

Work discontinued 1910-11 (Taught Latin full time) 1910-12  
and  $\frac{1}{2}$  time 1912-14, and  
 $\frac{1}{2}$  to full time 1914-15)

Assistant appointed in Snow Studies 1911-12.

Work discontinued 1912-13.

Work resumed 1913-15.

During 1911-15 a Temperature Survey of Truckee Meadows and Carson Sink has been nearly completed.

J. C. Churchill

Meteorologist.