CHAPTER XIX

THE JESUIT SEISMOLOGICAL STATION AT SPOKANE, WASHINGTON

By Francis J. Altman, S. J.

In the Spring of 1909 Reverend Eugene M. Bacigalupi, S. J., now Professor of Physics at Santa Clara University, ordered the Wiechert Seismograph and other instruments for the Gonzaga College Seismological Station.

The following letters of Reverend Father Frederick L. Odenbach, S. J., gave us some of the early history of the station:

St. Ignatius' College
Meteorological Observatory
Cleveland, Ohio
March 20, 1909

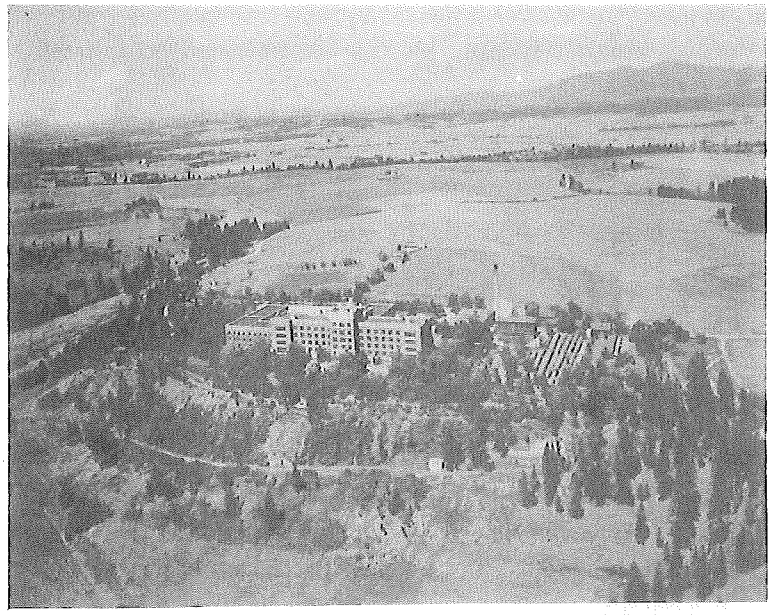
My dear Father Bacigalupi: P.X.

Spokane; Seattle; Santa Clara; Frisco; Denver; Saint Marys, Kansas; St. Boniface; Mobile; Chicago; Toledo; Cleveland; Buffalo; Worcester, Massachusetts; Brooklyn; Georgetown are in line---more will join ---Glorious is it not! Deo Gratias!

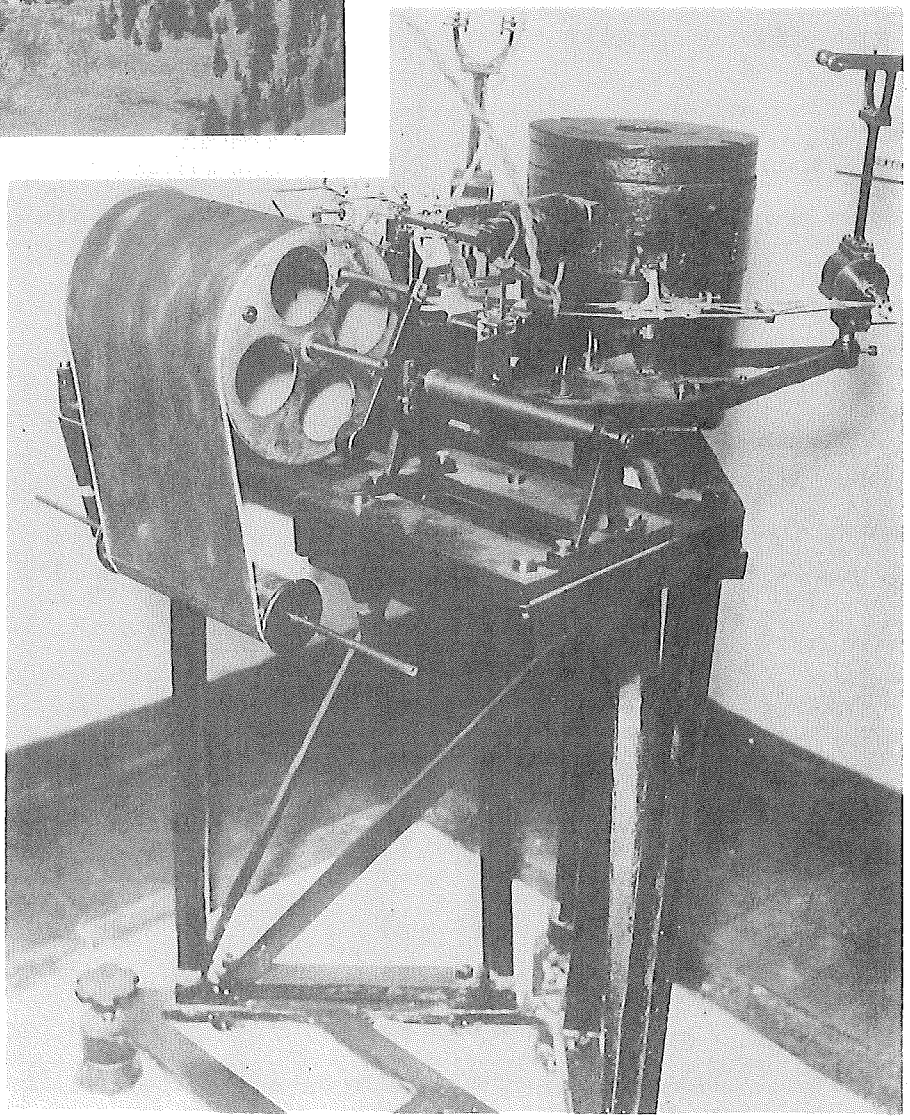
Give my thanks and good wishes to Father Rector Goller. Tell him his good example is worth much to the cause.

I have sent in your name for a catalogue to Spindler and Hoyer of Goettingen, Germany, but it will be some time in reaching you. If you desire to go ahead you may write them to duplicate my order which was for No. 175 pendulum,

Aerial View of Gonzaga University, Spokane, Washington - The Wiechert Seismograph was located under the Administration Building in the middle distance next to the church. In the foreground is the School of Engineering



Aerial View of Mount St. Michael's



Wiechert 80-Kg. Horizontal
Component Seismograph

No. 195 clock with minute and second contacts, No. 196 blackening and fixing apparatus together with duplicates of springs, etc., as they advised me.

When sending your order let them know the nearest custom house to which the goods may be marked "In Bond" so that the boxes are not opened far from home. Be certain about the pendulum No. 175, 80 Kg.

Later on I will send you printed matter containing directions.

With my kind regards and good wishes

Yours in Xto,

F. L. Odenbach, S. J.

St. Ignatius' College
Meteorological Observatory
Cleveland, Ohio
August 30, 1909

Reverend and dear Father: P. X.

Glad to hear that your instrument has reached you. I do not doubt but that you will find it easy to set up the instrument, if you follow the directions sent to you by the firm. We leave everything as they had it in their text except the magnification which we will make 160 times. Therefore move the little extentions of the aluminum lever forward so that the point stands opposite to the third point on the pen lever counting from the extension end of pen lever. All the rest is just as we want it.

Another suggestion that I would make is this. Since it is rather difficult to slip the ring of paper on and off the cylinder owing to the iron guard which projects downward under the cylinder (the right-hand one against which the little friction roller rests) I have cut out the screw hole thus and have driven a steal plate into the slot of the screw head thus making it a thumbscrew. With this little change made it is much easier to put on and take off the 90.5 cm. roll of paper.

Regarding your questions I may say this: Taking the enclosed gram you see that the first I' initial has lasted 4 minutes 4 - 1 = 3. 3 times 1000 gives 3000 Km. that is the distance of the quake from your station. If you cannot plainly see where I' ends and I'' begins take the minutes of total (4 plus 4)/3 times 1000 equals Km. Therefore 8/3 equals 2600 Km. In this case you see the gram gives two different answers. That is because it is artificial. Later on I may send out a photo of a real gram with the data and explanation.

The direction cannot be given by a single observatory. For that we require 3 and by plotting the three circles with the three distances of the different stations as radii the included space will be the one in which the quake took its origin.

All these things will be made clear by Chapter XVII in Earthquakes by William Herbert Hobbs (1907) D. Appleton and Co., New York. This book also explains the principle of the Wiechert pendulum. This book together with the list I have sent you will give you clear ideas on the whole matter.

The whole affair may look very formidable to you in the beginning but in a few weeks time you will understand the instrument perfectly and in the books I indicated you will find all the data of this new science especially in Sieberg and Hobbs or Dutton and Hobbs.

As soon as you have taken off, inspect it very minutely for waves ∿∿∿ like this if so fix it by shellac and preserve it putting on the date and the correction for the clock. I generally write with a stylus into the smoked surface, thus: "No. 10 of 1909, August 30 I' 8:30, II'' 8:34, M 8:45, clock 2" fast;" or, you may rub off a patch of the smoke and write on the white surface, later on. I generally preserve all my papers for a couple of days because after getting reports from newspapers you are often confirmed in suspicions regarding a certain irregularity in the line.

Now dear Father I hope I have helped you some. Get Hobbs and you will be all right, I am certain. If there are any more doubts, do not hesitate to write. In the interval as soon as your instrument is running get in communication with the newspapers. For the reports you will give them, they will very willingly warn you just as soon as they get their dispatches. As to the scientific work and the methods, we will find a way to settle that a little later on. First our instruments must work for the College.

With kindest regards for yourself and Father Rector

I am yours truly in Xto,

F. L. Odenbach, S. J.

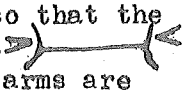
Meteorological and Seismological Observatory
St. Ignatius College
Cleveland, Ohio
January 20, 1910

My dear Father Bacigalupi:

P. X.

Your successes have given me much pleasure and I am glad you had so little trouble in setting up your instrument. I hope that in a month or two at the most all will be ready to exchange reports.

Regarding the migration of your pens, I have this to say: The cause may be one of these seven or a combination of some of them. (N.B. They rarely maintain the spaces exactly.)

1. The little trumpet shaped booms which extend from the aluminum lever to the lower pen arm are not drawn out enough so that the points are set into the agate thus  if so draw them out or if the two arms are not parallel and will not remain so with the new adjustment, level again by means of the screw feet of the tripod, or you can increase the pressure of the spiral springs a little so that the points sit fair and square in the center of the agates. A sign that this is the cause may be deduced from a record like this 

2. The paper has been pasted so as to have a slight cone shape. I have pushed the right hand iron tail piece against which the lower friction roller rests back a bit. Always draw the paper flush up against the right cylinder head then it will not wander from side to side.

3. Your pier may still be in a condition of instability. They take quite a time to settle and come to rest.

4. The wind may throw the building and with it tilt the foundation ground. These are causes which are objectionable and do not interest us except to get rid of them, however other causes are interesting and should be taken notice of.

5. Level changed by sunshine.

6. By distribution of barometric pressure.

7. Slow tiltings of short or longer duration.

These last three should be noted in a record book. If the pens have come so near to each other or are in such a position as is objectionable they should be returned to // position always by working with the two screw feet of the tripod.

Father, also keep record in your book of the earth pulsations; i.e., as to date and how long they lasted.

When in doubt or in trouble write. I will very soon send general instructions regarding what and how we are to do.

Yours truly,

F. L. Odenbach, S. J.

P.S. Fix one of your sheets on which the pens have wandered and the shaking you mention is recorded and send it to me.

And so the Spokane Station was started. The area about Gonzaga is all gravel, mainly glacier deposit. No special piers were sunk but the instrument rested on

the cement basement floor. However very fine records were obtained. Besides recording quakes many local disturbances were recorded faithfully such as the students' coming down the adjoining stairs, the street cars going around an ungreased curve in front of the building and the like.

In 1911 Reverend Father Bacigalupi left Gonzaga to finish his studies in Rome. For the next six years various professors of the college tried their hand at keeping the station going.

In 1915 when seismology had just been added to the other activities of the United States Department of Agriculture, Weather Bureau, the Chief of the Bureau, C. F. Marvin, invited Gonzaga to cooperate and in turn offered cooperation.

Two years later Mr. Aloysius M. Jung took over the station seriously. He became an ardent promotor of the Jesuit Central Station idea. With all his other activities, Mr. Jung found time to properly attend to keeping the seismograph going until the Fall of 1930 when it was decided that it would be better if the instruments were at Mount Saint Michael's about eight miles north of Gonzaga. At Mount Saint Michael's he helped Reverend Father Francis J. Altman, S. J., and Father Gerald R. Beezer, S. J., make the required adjustments. The first quake was recorded in January, 1931. Father Beezer did some very excellent gram reading but in 1935 he left Mount Saint Michael's to complete his Ph. D. work in chemistry. He is now Professor of Chemistry at Seattle University. Mr. Jung died a few years after giving

Reverend Eugene M. Bacigalupi, S. J.
Founder

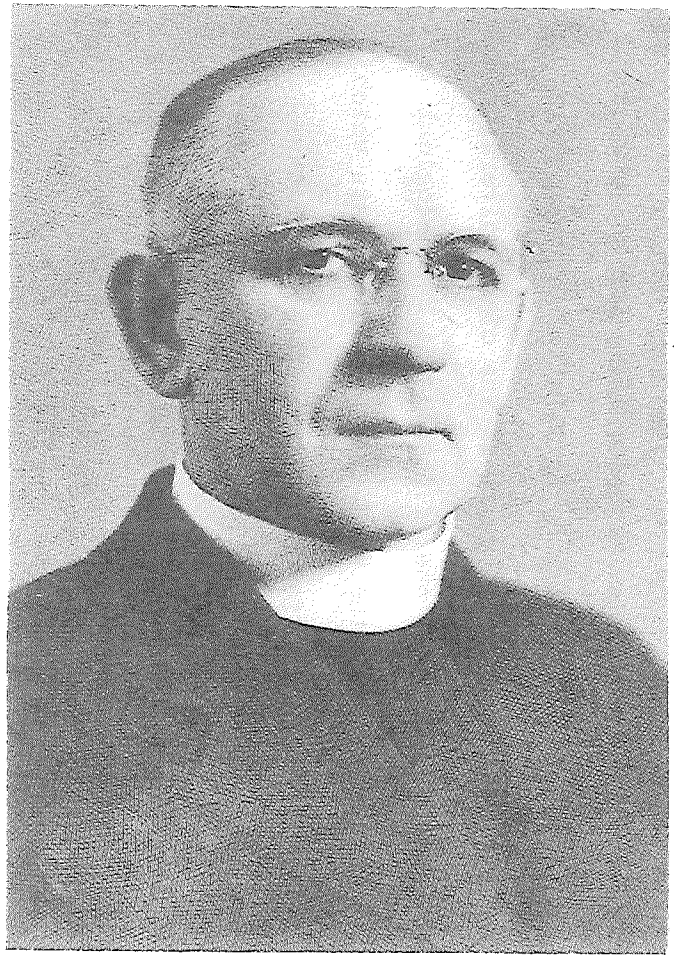
Mister Aloysius M. Jung

up the care of the seismograph.

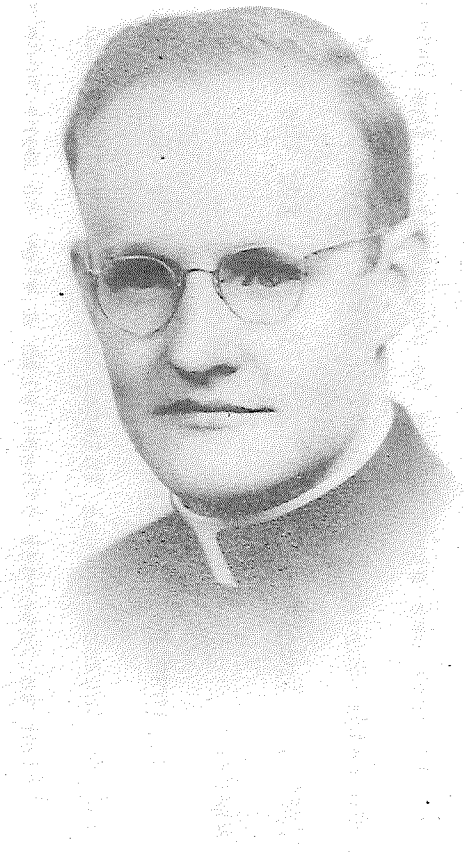
Father Paul P. Luger, S. J., and others became interested for short intervals. It was decided that Father Luger should continue his degree work and instead of coming back to Mount St. Michael's he took over the position of Professor of Physics in Seattle University.

Seismologically Mount Saint Michael's has a number of factors in its favor. The substratum is basalt over granite. Less than one foot of material had to be removed before solid rock was struck. As to coordinates, the United States Geodetic Survey Triangulation gave: Latitude 47° 43' 47.582", Longitude 117° 20' 26.391" for the local smoke stack.

In 1937 Mr. Charles P. Robbins and Mr. L. K. Armstrong of Spokane became interested in the station and in turn tried to interest others with a view to more modern instruments. But the rather sudden death of a prospective donor and other circumstances caused a delay and hopes went down until 1946 when Professor L. B. Slichter of the University of Wisconsin with the approval of the other university authorities offered to let one of the Jesuit Seismological Association Stations use the Wood-Anderson instruments which had not been in operation for some time. Reverend Father J. B. Macelwane, S. J., kindly invited Mount Saint Michael's to take advantage of the offer. The loan was gratefully

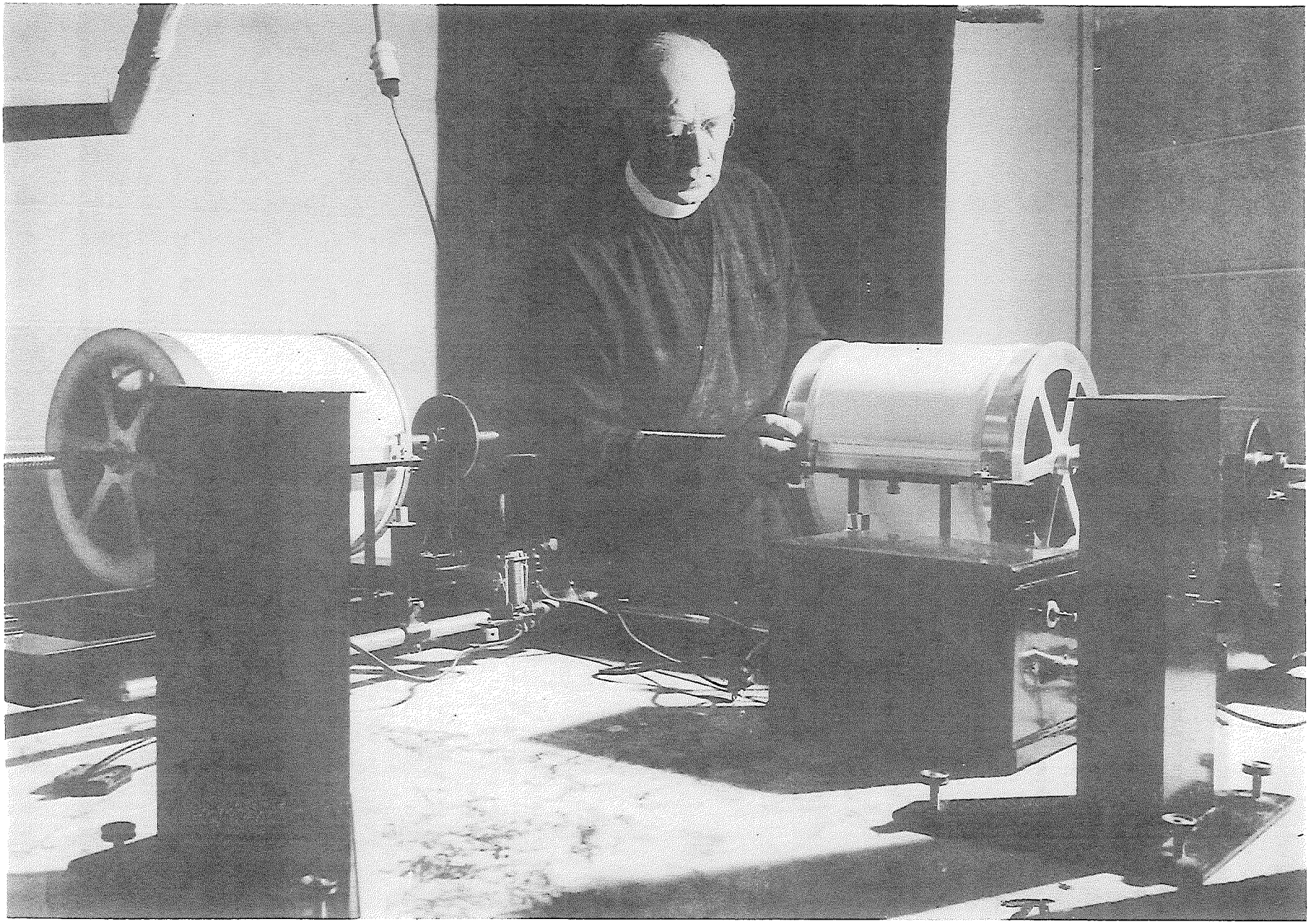


Reverend Francis J. Altman, S. J.
Present Director



Reverend Paul P. Luger, S. J.

Reverend Gerald R. Beezer, S. J.



Father Altman with the Wood-Anderson Seismographs at the Mount Saint Michael's Station

accepted and the instruments arrived in Spokane June 11, 1946. Reverend Father Macelwane loaned cylindrical lenses and suspensions. To complete the station a short-period seismograph and a vertical would be desirable and, I might add, a director who has more time to put to the care of the station.