

PROCEEDINGS VOLUME OF THE GEOLOGICAL SOCIETY OF AMERICA
ANNUAL REPORT FOR 1956
PP. 159-163, 1957

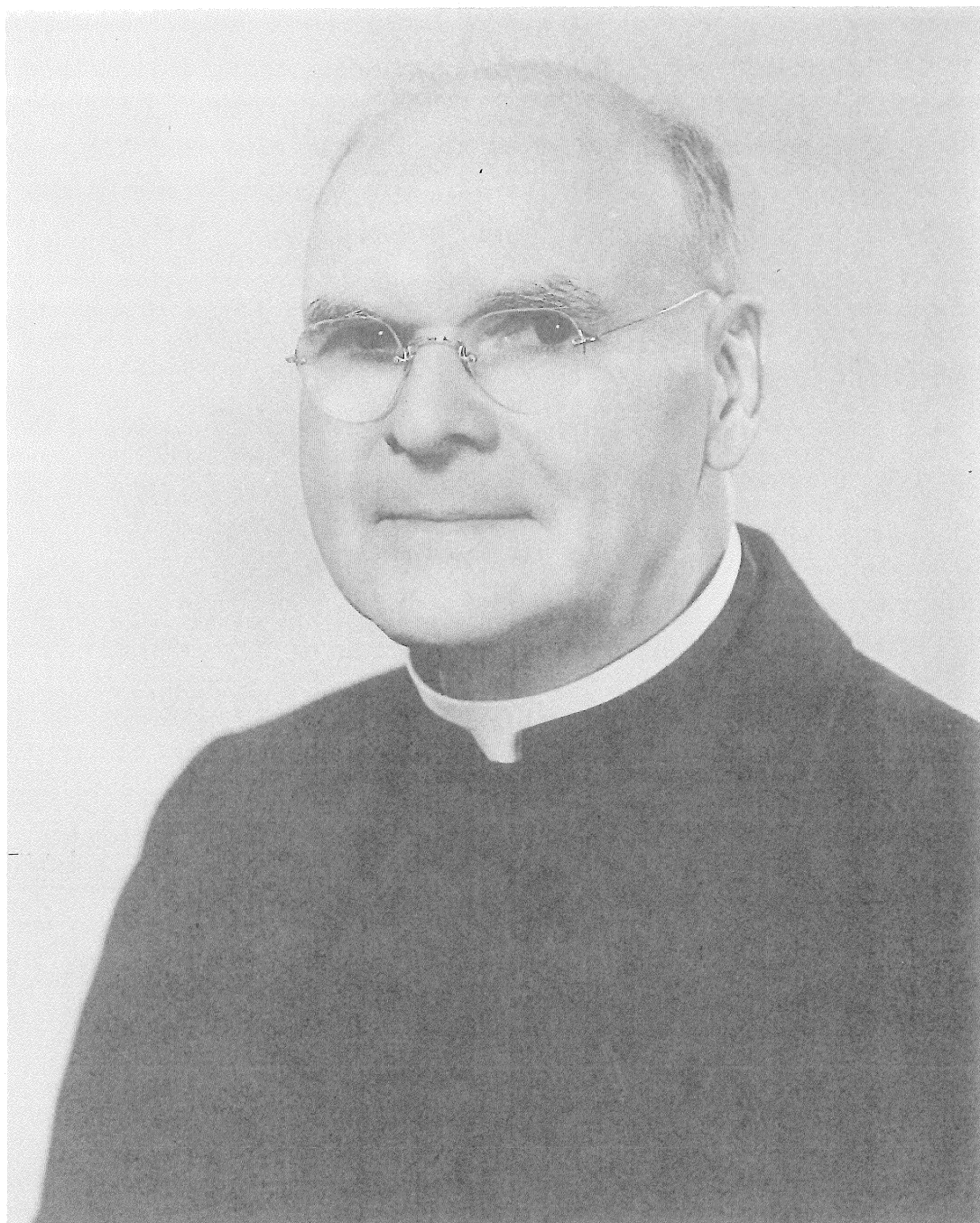
MEMORIAL TO JAMES BERNARD MACELWANE, S.J.
(1883-1956)

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PUBLISHED BY THE SOCIETY
SEPTEMBER 1957

Made in United States of America



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James Bernard Macelwane was born on the northern shore of Sandusky Bay near Port Clinton, Ohio, on September 28, 1883. He was the son of Alexander Macelwane and Catherine Agnes Carr Macelwane. Both were of Irish descent. However, the father traced his origin back to Belfast, and the mother back to County Longford. Macelwane was always proud of his Irish ancestry. He had a great sense of humor, and the fact that his paternal grandfather, James Macelwane, had been an Orangeman amused him. James was one of nine children, five boys and four girls. His father was both fisherman and farmer. The Macelwane children had to work as soon as they were old enough. After leaving elementary school, James worked for his father. Mending fishing nets, casting them, selling fish to the markets, and farming in between was grueling work for a young boy. The work seemed too much for him, and he became ill. At the age of eighteen he went up to Saint John's College in Toledo. In 1903 he joined the Society of Jesus. There followed long years of studies in theology, classics, and science. His first studies were at the Buffalo Mission in Cleveland. He wished very much to become familiar with foreign languages and felt that in this German mission he could learn German readily. He did. Later he learned French, Spanish, Italian, Latin, and Greek. He even made a speech in Greek in his later years. In 1908 he was assigned to the Missouri Province of his Order and proceeded to Saint Louis University to finish his training. He received the Bachelor of Arts degree in 1910, the Master of Arts in 1911, and the Master of Science in 1912. In 1918 he was an ordained priest.

It had been Macelwane's intention to pursue as his life work the study of literature and the classical languages. However, he was needed on the staff of Saint Louis University to teach mathematics and physics, so his interests grad-

ually altered. During this period he became interested also in geology, which fascinated him. He went on a number of field trips and was delighted. His career was further directed toward the earth sciences. The Jesuit Seismological Service was founded about 1910. Saint Louis University installed a Weichert seismograph, which of course didn't work when first set up. It was Macelwane and his associates who took it apart and put it back together again. Macelwane always enjoyed that sort of thing. After it was all over, he wrote his first technical paper, published jointly with J. S. Joliat, called *The Physics of the Seismograph*. He became instructor in physics at Saint Louis University in 1912 and then Assistant Professor. One of his earliest writings was a laboratory manual in Physics which he needed for his own instructional purposes. His interest in Seismology developed, and he read as widely as he could on the subject.

In 1921 Macelwane was sent to the University of California to earn the degree of Doctor of Philosophy. The problem which he undertook for a thesis was the study of surface waves. At that time seismologists did not know too much about the phenomena of dispersion. There was a question as to whether or not the periods of surface waves increased with distance as they traveled. Macelwane came to California to work with Professor Elmer E. Hall who had studied and published some papers on vibrations of buildings. At first Macelwane hoped to make the study with portable instruments and traffic vibrations, but this did not work. Meanwhile, Macelwane had met Professor Andrew C. Lawson who was most favorably impressed. An earthquake off the coast of California in 1923 suggested a new method of tackling the problem. Lawson borrowed seismograms of this earthquake from all over the world, and Macelwane studied the surface waves and found that

the predominant wave as he selected it was longer at greater distance. In the early days the University of California Library had the custom of entering on a card in the back pocket of the book the name of the person who drew out the book. Graduate students in Geophysics today are amazed to find Father Macelwane's name in almost every book they withdraw. He was a wide and intensive reader.

When he received his Ph.D. in Physics, Lawson invited him to become Assistant Professor of Geology, take charge of the Seismographic Stations at Berkeley and Mt. Hamilton, and develop courses in Seismology. These two seismographic stations had been established in 1886-1887 and were the oldest in the western hemisphere. But never had there been a man trained in seismology to look after them. Macelwane received permission from his superiors to spend two years in this position. Lawson told him to find a young physicist to train to take this place, and it was the senior author of this article who was selected. Macelwane and Bayley Willis became interested in improving the equipment of the Berkeley and Mt. Hamilton stations and in adding two more stations, one at Stanford University and one in San Francisco. Macelwane planned, and Willis raised the money. It was left to Macelwane's successor to carry out the plans. There are at present fourteen stations operating, the outgrowth of Macelwane's vision.

During the two years at Berkeley he again borrowed a set of records, this time of an earthquake in the South Pacific. Whether the core of the earth was fluid or solid was then a moot question. For a while Macelwane thought he could show it was solid from the records of this earthquake. Later he was doubtful, but, if one follows his writings, one finds that he was never convinced of its fluidity.

He started the policy of making both field and instrumental studies of local earthquakes in central California. His policy of making field studies was followed after he left and until such work was taken over by the United States Coast and Geodetic Survey.

In 1925 Macelwane returned to Saint Louis University where he was appointed Director of the new Department of Geophysics, a position which he held for the rest of his life. This De-

partment was finally enlarged into an Institute of Technology. Macelwane organized the Jesuit Seismological Association inasmuch as the earlier Jesuit Seismological Service had died. He remained president of this association for the rest of his life. In connection with this work, he developed travel-time curves and started a project of routine location of epicenters. He became very much involved with administration at Saint Louis University where, as Graduate Dean for a time, he reorganized the Graduate School.

In the national and international scene he played a large part. He was a Director of the Seismological Society of America from 1925 on and President in 1928-1929. He was active in forming the Eastern Section of the Seismological Society of America. In the American Geophysical Union he held many offices, and was President at the time of his death. He was very active in the International Union of Geodesy and Geophysics and also in the AIME and the Society of Exploration Geophysicists of which he was made an honorary member. He received the Bowie Medal for the American Geophysical Union and the Jackling Lecturer Award of the AIME. In 1944 he was elected to the National Academy of Sciences. He was National Lecturer for Sigma Xi in 1945. He was chairman of the committee of the National Research Council appointed to bring out the volume *Seismology* in the *Physics of the Earth* series, and a member of the similar committee which brought out the *Internal Constitution of the Earth*. He was connected with the Research and Development Board, the Scientific Advisory Board of the United States Air Force, and a member of the National Science Board. He was chairman of the Technical Panel on Seismology of the United States Committee for the International Geophysical Year. He was active in the Academy of Science in Saint Louis and also in the Missouri Academy of Sciences. He was elected a Fellow of the Geological Society of America in 1934.

He was interested throughout his life in seismic prospecting. In 1924 he was consultant to the Reiber Exploration Company. Later he was consultant to the General Geophysical Company.

His *Introduction to Theoretical Seismology*,

Part I, Geodynamics was a most successful book which bridged the gap as far as seismology was concerned between Love's *Mathematical Theory of Elasticity* and the minds of American students. In his later years it was through his students that he contributed most in the way of research and publications. One might mention especially the theses of Father Repetti and Cornelius Dahm on the interior of the earth, and of Father Ramirez on microseisms. The method of using tripartite stations to detect the direction of approach of microseismic waves was Father Macelwane's own. Ramirez applied it with some success. Others more recently have applied it to earthquake surface waves.

Father Macelwane's influence on the development of seismology in the United States was very great. He may well be called the Father of Seismology in this country.

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