

be the case, would not necessarily be a handicap.

The usefulness of a levulose sirup is apparent. It would probably not be used alone as a sirup, but would be used for blending with other sirups to enhance their sweetness. Glucose and maltose sirups would be greatly improved if their sweetness were increased. And in the manufacture of soft drinks and confections levulose could very largely replace sucrose, and thus increase the amount of the latter that would be available as dry sugar.

In view of the above considerations, therefore, it is to be hoped that some institution, federal, state, or industrial, will see fit to inaugurate investigations on the production of levulose sirup from the Jerusalem artichoke, in order to augment our present sources of sweetness.

J. J. WILLAMAN

UNIVERSITY OF MINNESOTA

RESOLUTIONS OF THE PAN-PACIFIC SCIENTIFIC CONFERENCE

V. GEOLOGY

1. *Geological Maps*

In the interest of science be it

Resolved, That the following maps of the Pacific region on the international scale of 1:1,000,000 be prepared as expeditiously as possible:

(a) A base map showing by contours or hachures as many topographic features as practicable.

(b) A map showing geological formations or groups of geological formations.

(c) A map showing mineral resources.

2. *Geological Surveys of Critical Insular Areas in the Pacific Ocean*

(a) Geological Survey of Easter Island

Since a knowledge of the geology of Easter Island might throw light on the question of whether there was in past geological time a westward extension of the land area of South American continent, be it

Resolved, That it is desirable to have a careful study of Easter Island to determine the

character and geologic age of the rocks composing that island.

(b) Geological Survey of the Hawaiian Islands

Since the results of a detailed geological survey of the Hawaiian Islands would aid in the solution of many problems of the Pacific region, be it

Resolved, That this conference strongly recommends that a geological survey of the Hawaiian Islands be made and that appropriate geological maps and descriptive texts be published.

(c) Geological Survey of the Several Small Islands in Eastern Fiji

Since raised coral atolls with exposed basements of bedded limestone or of volcanic material are found in eastern Fiji, and since a geological survey of these islands supplemented by reconnaissance work in the neighborhood of Suva would be invaluable in the study of the origin of coral reefs, and in elucidation of the geology of the southwest Pacific, be it

Resolved, That a topographic and geological survey of the several small islands, such as Mango, Thithia, Lakemba, Vanua Mbalavu and Tuvutha be made at the earliest opportunity, and the results published.

3. *Form of Ocean Bottom*

Because of their importance as supplements to geological work on land in determining the structural framework of the Pacific region and in interpreting the geological history of the region, be it

Resolved (a), That the configuration of the bottom of the Pacific ocean be determined with adequate accuracy.

(b) That charts of the littoral and sub-littoral zones be made in all practicable detail, for example, wherever possible these charts should be on scales ranging between 1:10,000 and 1:40,000.

4. *Post-Cretaceous Correlation*

Since such knowledge is essential to the establishment of an adequate basis for the stratigraphic correlation of the post-Cretaceous formations of the Pacific region, be it

Resolved (a), That in addition to the study of the post-Cretaceous stratigraphy and paleontology of the Pacific islands and of the land areas on the margins of the Pacific Ocean, that such work also be expedited in the Caribbean region, and in the region from Burma through the Himalayas to the Mediterranean Sea.

(b) That inventories of the living fauna and flora of the Pacific region be prepared at the earliest practicable date.

5. *Studies of Subaerial and Submarine Erosion*

Since it is coming to be recognized generally that a knowledge of subaerial and submarine erosion is indispensable to a correct interpretation of the history of the continents, the continental margins, and the oceanic islands during post-Cretaceous time, be it

Resolved (a) That geologists, geographers, seismologists, biologists and others who are interested in the facts of form within the Pacific Ocean and along its margins devote attention to the study of physiographic processes and the forms resultant from such processes.

(b) That geologists and physiographers make special study of the physical, chemical and other properties of igneous and sedimentary rocks so as to ascertain the difference in their resistance to erosive agents.

(c) That efforts be made to obtain assistance in furthering the study of such important agents as wave and current erosion, factors limiting wave base, the action of weathering and corrosive agents at the headwaters of streams, the forms of stream channels, the form of sea cliffs at different stages of development, the action of plants in retarding land erosion, and the sequential stages of erosion of fault scarps.

6. *Studies of Sedimentary Processes and Sedimentary Rocks*

Since it is generally recognized that the interpretation of a large part of the geological record demands a knowledge of the processes and the results of these processes in the formation of deposits of past geological time; therefore be it

Resolved (a) That geologists, oceanograph-

ers, geographers, biologists and others who may be interested devote as much attention as possible to the study of modern sediments and the processes by which they are formed.

(b) That geologists make special studies of the physical, chemical and other properties of sedimentary rocks to ascertain the conditions under which the deposits were formed and the changes that may have taken place in such sedimentary rocks after deposition.

(c) That all existing agencies be urged to study the phenomena referred to in paragraphs *(a)* and *(b)* above, and that efforts be made to increase the number of agencies for the prosecution of such investigations.

6. *Geological Cooperation*

Since it is desirable that the projects undertaken by the different workers in the Pacific region be so selected and so designed that each may be supplementary to the rest and so contribute to the uniform accumulation of geological information concerning the Pacific region, be it

Resolved, That steps be taken to advise in the planning of research to correlate the efforts of the different workers, and to promote in such ways as may be proper a uniform mode of publication of results.

VI. SEISMOLOGY AND VOLCANOLOGY

The dominant motive which has appeared in the convention of seismologists and volcanologists of the Pacific here gathered together for the first time, has been to promote more localized and more continuous observation of regional phenomena than has hitherto been accomplished in most seismic and volcanic districts. On the other hand, there is agreement that precise teleseismic triangulation is not a field for amateurs or for stations equipped with a multiplicity of inferior and diverse instruments.

There is a crying need for mutual information, regularly supplied by each observer to his distant colleagues, concerning volcanic and seismic happenings in each land. The employment of mariners and scientific expeditions to

collect specimens and notes for the volcanologists in remote places may be organized.

Education of the people in matters of earthquake-proof construction and safeguards against disaster has been proved to be a practicable and effective method of meeting volcanic and seismic crises.

Interest has recently developed in the earth tide, changes of level about volcanoes and measurable horizontal and vertical displacements directly related to earthquakes. These are matters for the national geodetic surveys and for geophysical investigation of high mathematical precision.

The three groups of motives above enumerated, respectively, localized work, publication and education, and precise geophysics are the fundamenta on which the following seismologic and volcanologic resolutions of the conference are built.

1. *Establishment of Volcano Observatories*

Useful volcano experiment stations have already been established in some lands, and more volcanologic experience is needed for protection against disaster of the increasing populations of Pacific countries and for the advance of science; therefore this conference

Recommends the continuance of the present volcano observatories and the establishment of new permanent volcano observatories in lands about the Pacific; and recommends that such a station for maintenance and publication of continuous observations should be placed on one of the more active volcanoes in each important volcanic district.

2. *Promotion of Localized Seismometry*

In addition to the work of existing establishments, the intensive study of both large and small earthquakes in seismic provinces by all appropriate physical, geological and other scientific methods may lead to important and rapid advancement in geophysical knowledge. This knowledge is of importance for economic and humanitarian as well as scientific ends. This conference therefore

Commends the existing institutions, recommends their continuance and expansion, and

urges early establishment of further specific programs of investigation and continuous observation in regional seismology, in special seismic districts about the Pacific. Timely publication of results is recommended. Moreover this conference recommends to the National Research Council of the United States the establishment of a program of research in regional seismology in the southwestern part of the United States.

3. *Publication of Volcano and Earthquake Information*

The workers in regional seismology and volcanology need accurate information about geophysical events in other localities than their own; therefore this conference

Recommends that prompt and authoritative publication of current facts and measurements concerning volcanoes, earthquakes, submarine eruptions and tidal waves be an essential part of the routine of all Pacific observatories.

4. *Precise Leveling and Triangulation in Relation to Volcanology and Seismology*

Great earthquakes and volcanic eruptions are often preceded and followed by elevations, depressions and horizontal displacements in the regions concerned; therefore this conference

Recommends that precise leveling and triangulation be carried on at definite time intervals, in selected seismic and volcanic districts, in order to ascertain precursory and other changes in underground stress accompanying great seismic and volcanic disturbances.

5. *Collection and Publication of Statistics of Earthquakes and Eruptions*

There is needed for certain Pacific countries more complete statistics concerning earthquakes and eruptions; and a complete list for the world should be eventually maintained; therefore this conference

Recommends that each Pacific country publish statistical lists of local eruptions, earthquakes, tidal waves and other related phenom-

ena; and issue catalogues of active, dormant and extinct volcanoes, and of local seismic features.

6. *Central Scientific Bureau*

Dissemination of volcanologic and seismologic knowledge will be furthered by working through a body cooperating with all Pacific countries; therefore the conference

Recommends the establishment of a central bureau for dissemination of scientific knowledge among the volcano and earthquake stations of the Pacific.

7. *Geophysical Samoan Station*

This conference commends highly the work done at the Geophysical Observatory at Apia, Samoa; and expresses the hope that the service of that station will be continued.

8. *Education of Dwellers in Districts Liable to Disaster*

Great injury and loss of life to persons and damage to human constructions may be caused by earthquakes and volcanic eruptions and may be decreased by general education; therefore this conference

Recommends that countries liable to seismic disaster educate the people in proper methods of construction, in behavior during emergencies, and in the history of such catastrophes elsewhere.

SAMUEL SHELDON

DR. SAMUEL SHELDON, of the Polytechnic Institute of Brooklyn, died at Middlebury, Vt., of Bright's disease on September 4, 1920. He was a professor of physics and electrical engineering at that institution for the last thirty-one years, and enjoyed a wide reputation as a physicist, educator and consulting engineer. In appreciation of his services to the Polytechnic, his colleagues of the faculty and the members of the corporation at recent meetings adopted the following minute:

The corporation and the faculty of the Polytechnic Institute of Brooklyn desire to give expression to the great loss sustained by the death of Dr. Samuel Sheldon who for thirty-one years served

the Polytechnic as professor of physics and electrical engineering.

As an educator he was beloved and admired for his sterling qualities of mind and heart, for his earnestness and enthusiasm in the lecture-room, and for his genial good humor on all occasions. The personal interest he held for his students followed them in their professional work, and he derived pleasure from their achievements. They in turn affectionately called themselves "His Boys."

As an engineer he attained eminence through his integrity and straightforwardness of character; and by forceful personality and keen judgment he reached the highest offices in national engineering societies. This broad contact with the engineering fraternity and his association with men of attainment brought him experience and vision of inestimable value to the Polytechnic.

As a colleague he will always be remembered as a man of action, of precision, yet sympathetic and kind—above all inspiring. He lived for the Polytechnic, worked unceasingly for its upbuilding, and was rewarded with the happiness that came through the realization of his ideals.

We, the members of the corporation and faculty of the Polytechnic Institute, herewith express to his family our deep respect and esteem for our beloved Dr. Sheldon and the profound regret that we shall henceforth be deprived of his valuable assistance and counsel in the solution of our educational problems.

Dr. Sheldon was born in Middlebury on March 8, 1862, the son of Harmon Alexander and Mary Bass Sheldon. He was graduated from Middlebury College in 1883 with the degree of A.B. and then pursued graduate work, receiving the degree of A.M. in 1886. During the next two years he studied at Würzburg, Germany, and received the degree of doctor of philosophy there in 1888. During a part of this time he was associated with Kohlrausch, the distinguished physicist, in his celebrated determination of the ohm as the unit of electrical resistance. He was awarded the honorary degree of doctor of science from the University of Pennsylvania in 1906, and from Middlebury College in 1911.

Dr. Sheldon was the author and joint author of several college text-books. Among them were "Direct-Current Machines," "Alternating-Current Machinery," "Electric Trac-