casionally appearing in small acicular crystals with or without biotite, resembling those found in Norway and Greenland; låvenite, one of the most constant minerals of these rocks, and the most notable colored mineral of the rocks at Rofare, the small crystals being remarkably well defined, with intense polychroism; the author believes that these nephelinic syenites of the Isles of Los are those in which låvenite occurs most abundantly; rinkite; astrophyllite, constant in the syenite of Rouma Island, but only exceptionally found in that of Kassa Island; biotite, not often met with, sometimes perpendicularly impaled on the surface of crystals of magnetite; eudialyte, occasionally showing metamorphosis into catapleiite; villiamite, named by M. Lacroix after his faithful collaborator, M. Villiaume, a mineral characterized by an intense polychroism; fluorite, colorless, pink or light violet; pyrochlore, particularly abundant in the normal syenites of Rouma Island; galena; analcite, which the author regards as formed in a pneumolithic phase and not a product of decomposition; hydrophyllite; mesotype; losite and a number of other minerals. Many of these are present in the second group of syenites in addition to zircon, titanite, titanomagnetite, woehlerite, etc.

Chemical analyses of a number of specimens of the syenite are given and the examples shown in the plates are very fully elucidated. We have only been able to note a few of the more important data contained in this stately, valuable contribution to petrography by France's greatest petrographic geologist.

George F. Kunz

*Ka hana kapa: The Making of Bark Cloth in Hawaii.* By W. T. Brigham, A.M., Sc.D. Memoirs of the Bishop Memorial Museum of Polynesian Ethnology, III. Honolulu, Museum Press. 1911. 4to. Pp. 273; 48 plates and atlas of 26 colored plates.

It is well known to ethnologists that among the few living men having personal and scientific knowledge of the ethnology of the Hawaiian Islands, the director of the Bishop Museum stands unrivalled. During the period in which that museum has engaged in publication a succession of memoirs has proceeded from his pen, in which a vast amount of otherwise unwritten Polynesian lore is fortunately preserved. The present volume is devoted to the history and description of the bark cloth, tapa or kapa, of the Polynesians, a manufacture which reached its greatest perfection in Hawaii, and which, on the coming of the white man, with woven cloth and figured calico, deteriorated and soon practically ceased. Museum specimens alone preserve for us the actual material, on which Hawaiian art and fancy were so lavishly expended.

Dr. Brigham gives us first the history of its manufacture as described by the earliest voyagers, from Hawaii to Madagascar, the Philippines, and even Africa; then an account of the dyes and tools used; botanical descriptions and figures of most of the plants and trees from which the raw material was obtained; the uses of the finished product; the designs used in its ornamentation; a vocabulary of kapa terms, lists of the material studied in the various museums and in his own private collection, with numerous illustrations in the text; and finally an atlas of beautifully executed plates in color, reproducing the exact designs, with many black and white plates illustrating simpler variations, both from Hawaii and other regions where the art was practised.

Dr. Brigham and the trustees of the museum are to be congratulated on the appearance of this splendid monograph which preserves for posterity a wealth of information, much of which might, and indeed probably would, otherwise have been lost to the world in the course of a few years.

Wm. H. Dall

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## *ANNUAL REPORT OF THE SMITHSONIAN INSTITUTION*

The Smithsonian Report for the year 1910 has just been published by the institution. Besides the report of the regents and the secretary, the volume contains, as usual, a "General Appendix" consisting this year of

thirty-four papers of popular interest on various branches of science, also biographies of a number of prominent scientific men who have recently died. Some of the papers are original, while others are reprinted from foreign and domestic scientific and technical periodicals. The following statement of the contents has been sent from the institution.

A review of modern progress in aviation is ably recorded by the late eminent aeronautical authority, Mr. Octave Chanute. His paper covers the principal advances made in aviation, beginning with the experiments of Hiram Maxim in 1894, and including Langley's experiments, 1896–1903, the author's own investigations, the work of the Wrights, Dumont, de Lagrange, Farman, Bleriot, Bell, Curtiss and others, bringing the subject down to the close of the year 1909. Altogether it is a most interesting review, illustrated with 19 plates and several text figures.

Mr. F. H. Newell, director of the Reclamation Service, sets forth the recent progress in the reclamation of the arid lands in the western states. The work of reclamation includes all the western states and territories, where nearly 10,000 families are being supplied with water. Through this great undertaking, the waste waters of the west are being conserved, destructive floods prevented, apparently valueless lands converted into productive farms, and thousands of families settled in newly opened territory where they are maintaining homes on reclaimed land. Besides engineering with its business and financial problems, the article deals with many other subjects, such as the character of settlers, the size of farms, crops, etc., and the individual projects which together furnish water for about 1,000,000 acres, nearly one half of which is already settled.

A kindred topic is the great electric power plant at Keokuk, Iowa, with its 4,278-foot concrete dam across the Mississippi River between Keokuk, Iowa, and Hamilton, Ill. This subject is treated by Mr. Chester M. Clark, in a well-illustrated article entitled, "Electric Power from the Mississippi River." The paper shows the development of the largest single hydro-electric plant in existence, through the construction of what is undoubtedly the greatest bank-to-bank dam in the world.

Under the heading of physics, Dr. T. Thorne Baker has written an account of experiments and researches in the telegraphy of photographs, transmitted by both the wire and the wireless systems; Mr. Jean Becquerel, professor at the Museum of Natural History of Paris, has permitted the translation of his valuable paper on "Modern Ideas on the Constitution of Matter," comparing the old theories of matter with the newer ones recently confirmed by experiments; and Professor R. A. Millikan has abridged his treatise on "The Isolation of an Ion," which deals with the exact measurement of an elemental electrical charge and several analogous problems.

On the testing of explosives, Dr. Charles E. Munroe, professor of chemistry at George Washington University, and a well-known authority on explosives, has written an interesting paper on the "Modern Developments in Methods of Testing Explosives."

Charles G. Abbot, director of the Astrophysical Observatory of the Smithsonian Institution, contributes an article on the recently developed subject of astrophysics, which is a study of celestial physics, but pertains principally to the heat and other physical properties of the sun. The paper relates to "The Solar Constant of Radiation," a topic on which Mr. Abbot is well informed, having pursued studies in that direction for nearly sixteen years, at the Smithsonian observatory in Washington, and on Mount Whitney and Mount Wilson, California. In this article the author deals with the problem of measuring the amount of solar heat received by the earth and that lost in transit to it, and the reader finds himself amazed at the obvious facts and reasonable possibilities depending upon the heat from the sun. The subject of astrophysics is further treated by Messrs. Curtiss, Deslandres and Bosler, in three timely articles.

Under the title "What is Terra Firma?" Mr. Bailey Willis, of the U. S. Geological Survey, attacks the old, yet modern, problem of the construction and balance of our globe,

in a review of current research in what is known as "isostasy." In the discussion of this puzzling question, Mr. Willis advances the theory that the foundation of all the continents is composed of solid rock which is self-crushed to a depth of about 120 kilometers, but rendered sufficiently rigid by pressure to maintain its form during prolonged geologic periods with but slight change. In spite of stresses occasioned by erosion of continental reliefs, this mass is capable of movements sometimes resulting in the gradual elevation of continents and the more vigorous uplifting of mountains, through which isostatic equilibrium is restored.

In line with the construction and condition of the globe, another author, Professor Thomas Chrowder Chamberlin, brings up the further vital question, "The Future Habitability of the Earth," in an article in which he reviews the past, and considers the future, of the world as a dwelling place for the human race. Many branches of science enter into the discussion, but upon geology, physics, chemistry, astronomy and astrophysics rests the burden of the arguments. Mr. Chamberlin thinks that the earth will remain habitable for tens of millions of years, but concedes that the close approach of a celestial body to the sun would probably result in the disruption of the solar system and bring disaster to the earth. He further states, in regard to the future possibilities of scientific research, that "when moral purpose and research come to be the preeminent characteristics of our race by voluntary adoption and by the selective action of the survival of the fittest, and when these most potent attributes join in an unflagging endeavor to compass the highest development and the greatest perpetuity of the race, the true era of humanity will really have been begun."

Several papers come under the head of botany, among them an interesting sketch of the sacred ear-flower of the Aztecs, a plant whose identity has been a mystery for years and only recently rediscovered by the author, Mr. W. E. Safford, of the Bureau of Plant Industry. This little flower, resembling the human ear, has a remarkable history and dates back to the early explorations of Mexico. It was first described in 1569, by Padre Bernardino de Sahagun, who states that it was much used owing to its delicious fragrance and its flavor when used as a spice. Despite the formidable name, Xochinacaztli, which it bears, the author suggests its cultivation on account of its unusual fragrance and pleasant spicy flavor. Mr. Henry S. Graves, chief of the Forest Service, contributes a well-illustrated and original article on forest preservation, in which he carefully considers all points in the great problem, making many things clear which have long been obscure.

Those interested in medical research and allied subjects will find matter of concern in the following papers: "Manifested Life of Tissues Outside of the Organism," by Alexis Carrel and Montrose T. Burrows; "Epidemiology of Tuberculosis," by Robert Koch; "The Significance of the Pulse Rate in Vertebrate Animals," by Florence Buchanan, D.Sc., and "Sanitation on Farms," by Allen W. Freeman, M.D.

A comprehensive paper on the contemporary Slav peoples, from a geographical and statistical point of view, by Ludor Niederle, of the Bohemian University of Prague, which has been translated from the Slavic language into English, furnishes new information on the history and distribution of these peoples. Dr. J. Walter Fewkes, of the Bureau of American Ethnology, contributes a brief review of his recent work and investigations in cave dwellings, both at home and abroad. This paper is entitled "The Cave Dwellings of the Old and New World."

The Report also contains biographies of Melville Weston Fuller, Sir Wm. Huggins and Alexander Agassiz, together with papers on several other subjects treated by competent authors, many of whom are world-wide authorities.

## *SPECIAL ARTICLES*

### CESTODE CELLS IN VITRO

The desirability of throwing any light whatsoever upon the question of the character of