Ocean, at the Azores, in deep water along the coast of Spain and from the Madeira and the Canaries southward along the coast of Africa. All of these bottles that have been recovered have been found on the coast of South America, on the Antilles, and some of them as far west as the mouth of the Rio Grande. It can be inferred from this therefore, that every buoyant object which has been dropped into the ocean during the present geological epoch by prehistoric or historic Spaniards, Portuguese or Africans has found its way to America and been stranded somewhere between the 10th parallel south and the 30th parallel north.

In the northern part of the Atlantic Ocean the currents run the other way and the mails have been delivered from America to Europe. In the Pacific Ocean the daily mails delivered on the west coast of America from Mount Saint Elias southward have proceeded from about the 20th parallel north, in the vicinity of the Malay Peninsula and Archipelago, thence have travelled through the China Sea and the Japanese Sea to pick up objects designed for the Western Hemisphere.

In the Southern Hemisphere the mails travel the other way and materials consigned to the Ocean Current Company were taken from Chili and Peru to be delivered upon the Easter Island and the various groups of Polynesia, some of them reaching as far as Melanesia. In addition to these great mail services of the Pacific there was a narrow strip of service called the 'counter-current' between the equator and the 10th parallel north, the articles consigned to it being delivered on the west coast of Central America.

In the Arctic Ocean the mails proceeded from west to east, passing up through Bering Strait, across the Pole, and finding their way first to east Greenland and then around Cape Farewell to the southwestern shores of that great island. The Arctic current from Baffin Land and northward brought the mails from the Eskimo area southward even as far as Charleston, South Carolina. The consequence of such uninterrupted communication cannot be overestimated. All who have studied the arts of primitive races know how quickly their plastic minds respond to a congenial suggestion. It would not even be necessary for a Chinese or Japanese vessel to bring a single living teacher to take part in the pedagogic work of instructing the West Coast tribes in eastern Asiatic arts.

The recent example of a throwing stick which drifted from Port Clarence, south of Bering Strait, and was picked up on the shores of west Greenland by Dr. Rink, is one of an interrupted series of communications between one of those great mailing stations and another. A second element in technical pedagogy has not been emphasized by any modern writer, and yet it cannot be overlooked; and that is the survival of industrial processes and productions in the myths and traditions of wandering tribes, so that one of them having passed over a long area where a certain kind of activity was not demanded, and coming again to a place where the conditions are favorable to its revival, changed a song or an ancient tribal memory into an actual fact again.

O. T. MASON.

FIELD WORK OF THE UNITED STATES GEOLOGICAL SURVEY.

THE plans of operation of the United States Geological Survey for the fiscal year 1897–1898 have been approved by the Secretary of the Interior and the work of the field season of 1897 has been started, the parties having all taken the field. The sums appropriated for the Survey this year were given in detail in a recent issue of SCIENCE, separate amounts being set apart for specific branches of work and for the

salaries of persons connected with these branches, making the aggregate amount for the Geological Survey for the fiscal year 1897–'98 $967,840, a decided increase, though the additional sum does not go to the geologic branch.

For convenience in administration the work of the Survey is divided into four branches, each of which is again separated into a number of divisions. The branches are geology, topography, publication and administration; geology and topography being the main branches.

In geology the field work extends all over the United States from New England to the Pacific. Professor N. S. Shaler, of Harvard University, is at the head of a party which will continue the work begun last year of the survey of the Richmond coal basin of Virginia. Professor Walcott says in his report: "Although these Virginian fields are apparently remote from the New England region, the geologic problems are closely related to those which Professor Shaler has particularly studied, and it is convenient to continue the work under his direction." Professor Shaler has already completed the study of the Narragansett coal basin in Massachusetts and Rhode Island, and the publication of results has been begun; and a report on the Cape Cod geology is also proposed for publication.

A party under Professor Emerson is continuing his work of the last six years in studying the crystalline schists in eastern Massachusetts, and one under Professor T. Nelson Dale, in cooperation with Professor Wolff, will extend the work of previous years north and east to cover the area of the Bennington (Vt.) quadrangle. The study of the roofing-slate belt of New York and Vermont has been completed. Professor Kemp, of Columbia University, goes to the southeastern Adirondack area to work on the mapping of that section.

Professor J. E. Wolff will make a special study of the crystalline rocks of northern New Jersey, including zinc and iron ore deposits. He will also complete the survey of the Franklin (N. J.) quadrangle. He will also assist Professor Dale, as above mentioned. Mr. David White will study the coal deposits of Ohio, Pennsylvania, Virginia, West Virginia and Tennessee, from a paleobotanic standpoint, and Mr. M. R. Campbell will continue the study of the distribution of the coals of West Virginia and Kentucky. Mr. J. A. Taff will inaugurate work in the coal fields of Indian Territory. Dr. C. Willard Hayes' work in the southern Appalachian province has been brought to such a stage of development that he will prepare a monographic report upon it. Mr. Arthur Keith will continue the mapping of the crystalline rock areas in which he has been engaged, extending from the northern line of Maryland to North Carolina. His work is directed to an elucidation of the obscure geologic relations of the rocks of the Blue Ridge and Piedmont Plateau and their bearing upon geologic history.

Two parties will be sent to the Coastal plain region. One, under Dr. William B. Clark, of Johns Hopkins, will study the Cretaceous formations, which include the marl and clay beds of Maryland and New Jersey, and one under Mr. George H. Eldridge, who has been working for the past year on his report of the phosphate deposits of Florida, will spend the summer in the Atlantic Coast plain region.

Seven parties have been sent to the interior Mississippi region, and five to the Rocky Mountain region which lies between the British and Mexican boundaries on the north and south, the margin of the great plains on the east, and, approximately, the line of the 119th meridian on the west, and embraces the Rocky Mountains and their foothills. Mr. Arnold Hague is in charge

of one of these parties, which will do the field work necessary to enable him to complete his monograph on the Yellowstone National Park. This was interrupted by his work on the Forestry Commission of the National Academy of Sciences last year. Professor Hague will survey the Absaroka Range, one of the most rugged and inaccessible of the Rocky Mountains. Dr. W. H. Weed will continue the study of ore problems, etc., in Montana.

Mr. S. F. Emmons will be in Europe the greater part of the season, but under his direction surveys of the Tintic mining district of Utah will go on.

The Pacific region is covered by five parties, but the appropriation of $5,000 made for work in Alaska was not passed in in time to be available during the present year.

The paleontologic work is to be continued on the same lines as during the last year. "Special attention," says Professor Walcott, "will be given to the identification of certain fauna and flora in the coal regions of the Appalachians and the Rocky Mountains, and a thorough study will be made of the Cretaceous fauna of Colorado, Texas and Kansas, and the Tertiary fauna of California and Oregon, with relation to areal and vertical distribution, for the purpose of aiding the geologist in the solution of problems in areal geology. This will require that several members of the paleontological force shall continue field work, either independently or in connection with geologic parties."

It is also proposed to continue the collection and publication of data touching the mineral resources of the United States. Dr. D. T. Day has direction of this work, and $20,000 has been specifically appropriated for it.

One hundred and seventy-five thousand dollars has been allotted for topographic surveys proper and $150,000 for forestry surveys, and the plan of work will not be changed in character and organization from that of last year, except that additional work is imposed by the survey of the forest reserves.

The work of subdivision and topographic mapping in the Indian Territory is continued under C. H. Fitch, with the same organization as last year. Mr. Fitch expects to complete his field work by December 1st, with the exception of the resurvey of the Chickasaw Nation, for which $141,500 has been especially provided.

THE PHYSICAL SOCIETY OF LONDON.

THE Physical Society of London (or, as it is more generally called, the Physical Society) was founded in 1874 and was the outcome of a movement set on foot by the late Professor Frederick Guthrie, at that time professor of physics in the institution now known as the Royal College of Science. Among the original members of the Society were Professor W. G. Adams, Dr. Edmund Atkinson, Mr. Crookes, Professor Carey Foster, Dr. Gladstone, Professor Guthrie, Mr. Haddon, Professor John Perry, Professor A. W. Reinold and Professor Tyndall.

The purposes of the foundation were the receiving and discussing communications relative to physics, the exhibition of apparatus for physical research and of experiments illustrating physical phenomena and the publication of communications made directly to the Society and of other papers relating to physics.

Through his official connection with the Royal College of Science, Professor Guthrie was able to secure the consent of the Lords of the Committee of Council on Education, who are the authorities having jurisdiction in the matter, to the meetings of the Society being held in the physics lecture room of the College of Science and to the use of the physical laboratory and apparatus of the