on an island in its centre — like Crater Lake, in Oregon, though on a larger scale. Out of it flows the Waikato River, running 200 miles northerly and westerly; and along its banks, some 25 miles from the lake, is one of the two great geyser districts of the island. The other and more extensive district is 40 miles north-north-east of Lake Taupo, and about the same distance from the shores of the Bay of Plenty. Here, among the mountains, lakes, and forests of the famous lake district of New Zealand, are the celebrated geysers, hot springs, mud volcanoes, and solfataras, which rank next to those of the Yellowstone in interest, and even surpass those of Iceland. Of the lakes the most picturesque is Tarawera, surrounded by rugged bluffs, with the mountain-peak of the same name close by, to the eastward. Next in size is Lake Rotorua, 6 miles in diameter, with a little extinct volcanic cone in the centre. Rotomahana, or Warm Lake, is surrounded by boiling springs and siliceous terraces, and the temperature of the whole body of water is always as high as 90° F.

It was here, then, in the lovely lake district, and from the 'not dead but sleeping' peak of Tarawera, that the great eruption burst forth on June 10, — an eruption unprecedented in the history or traditions of the island, though far surpassed by others that have left their ineffaceable record in the rocks. Two years ago, it is said, the water of Lake Ratakakahi, usually cold, grew hot; and there was a strong outflow down the Wairoa valley into Lake Tarawera for a day, when it resumed its normal condition. This was all the warning, so far as yet known, of this awful convulsion. At 1 A. M., the inhabitants of the little village of Wairoa were aroused by a violent shaking of the earth, followed by a continuous but not unpleasant motion. A bright red glow became visible about the top of the mountain, and vivid flashes of light seemed to shoot up into the air. In an hour the flashes of light became what seemed a massive pillar of fire, rising, increasing, and extending along the range. A dull rumbling accompanied it, and became a terrific roar, with continuous explosions, loud thunder, and vivid lightning, till heaven and earth seemed to be torn asunder. The air was filled with sulphurous odors, falling stones, mud, and lava. The village was annihilated, more than a hundred natives perished, and the fertile plains were buried in mud and ashes.

Such, briefly, are the first particulars that have reached us of this terrible convulsion. It has indeed given a temporary check to the progress of the island. But the mountain is now said to be quiet again, and perhaps not many years will have passed before the catastrophe is forgotten and its damages repaired, as has been so often the case with Vesuvius and Etna. Geology teaches that this is an old and dying region of volcanic energy, and that each eruption is less violent than the one preceding. We may therefore hope that this paroxysm will give relief, until the tension of the earth's crust, accumulated for another decade of centuries, shall again burst its bonds.

EVERETT HAYDEN.

THE AMERICAN LIBRARY ASSOCIATION.

THE ninth general meeting of this association was convened at Milwaukee, Wis., on Wednesday, the 7th of July, and was dissolved on Saturday of the same week. Dr. W. F. Poole, president of the association, and librarian of the Chicago public library, presided at all the sessions, of which the first were mainly devoted to the reports of committees, and the address of the president, which was brief and pertinent. Dr. Poole dwelt on the present urgent needs of libraries in general, and regarded it as a great misfortune that the plans for a building for the library of congress, presented to the association at its Washington meeting in 1881 and condemned by the unanimous voice of its members, and also the year following at Cincinnati, should have been definitely adopted by congress. The committee on the American library association catalogue reported progress in the work of formation of a catalogue of the works most suitable for the foundation of public libraries. The programme of the meeting was one of unusual interest, embracing about twenty-five papers relating in large part to special points in library management, though by no means wholly so. For example: Mr. Richardson's (Library Hartford theological seminary) paper, 'Why librarians know,' showed a very good basis for his modest plea for the recognition of librarianship as one of the learned professions. Whether they profess it or not, at all events librarians practise learning, and they have to do so, or they couldn't be librarians. The librarians of the new era are a long way from exemplifying the common insinuation that their knowledge relates rather to the outside of books than to their contents. Among librarians the number of book-producers is very large. Mr. Charles A. Cutter (Boston athenaeum) followed with a brief paper on 'Close classification,'— a problem which, more perhaps than any other, is agitating the librarians of to-day. Shall the library be divided into a few broad classes, — history, geography, science, art, literature, and the like: or shall these be broken into smaller parts, setting the history of England, Germany, France, etc., each by itself, and breaking up science into physics, botany, zoölogy, etc.;

or shall the subdivision be carried further, making periods in the history of countries, and dividing zoölogy into the orders and families of animals, and so on, or, even further still, allowing a place in the history of England, France, and Germany for every reign, also dividing mathematics into arithmetic, algebra, the calculus, etc., and breaking up orders of animals into genera and species? Each successive subdivision intensifies the difficulty of keeping all the books on a subject together. Grouping books does not remove them one from another at all: they are no farther off than before subdivision. Mr. Cutter was a strong advocate of putting by themselves all books on well-marked subjects. Mr. Lane (Harvard college library) submitted specimen sheets of an index for catalogues, which elicited discussion; following which was a paper on 'Close classification *vs.* bibliography,' by Mr. William I. Fletcher (Amherst college library). Classification as used in the sciences, he said, may be exact; but as used in a library it cannot be, for the reason that many of the best contributions to the discussion of a subject are not detachable from the books or sets of publications which contain them. The librarian must advise his readers to find in every possible way what is the actual literature of the subject he may have in hand. Bibliography is the watchword for the librarian of the future; and this, rather than classification, must furnish readers with the means of tracing the literature of their subjects. Mr. Fletcher regarded close classification as having fatal defects, as a system for the guidance of the reader to the resources of a library in a given subject; and it should be relegated to a subordinate place as a minor factor in library administration. The library system of our day has one important mission, that of furnishing the means of culture to a people whose life is in danger of being drawn into a fatal specialization. Mr. Fletcher characterized the prevailing system of classification as an attempt to substitute machinery for brains, and said that the greatest present needs of our libraries are intelligent librarians and assistants, and the best obtainable intelligence crystallized in bibliographic books.

Next came an elaborate paper on 'International copyright in congress,' by Mr. T. Solberg (Library of congress), who reviewed at great length the history and progress of congressional legislation on this subject. The paper was not read, but will be printed in full in the Proceedings of the association.

The evening session of the second day was entirely characteristic of the work of the association, being largely occupied with the technical details of library work, and embracing papers and talks by Mr. Cutter on author-notation for Greek and Latin classics, by Mr. J. N. Larned (Buffalo public library) on a few of the devices and arrangements in a library building, and by Mr. Melvil Dewey (Columbia college library) on 'Eclectic book-numbers,' illustrating simple methods of finding books on the shelves. Mr. R. B. Poole (Y. M. C. A. library, New York) reported, for the committee on congressional legislation, a resolution, which was adopted, recommending such legislation as shall enable libraries to send books to their outside clientage as second-class matter at one cent per pound.

The evening session of the third day was taken up with two noteworthy papers, — 'The first librarians' convention, 1853,' by Mr. E. M. Barton (American antiquarian society, Worcester); and 'The teaching of bibliography in colleges,' by Mr. R. C. Davis (Michigan university library), giving an outline of the system now employed at Ann Arbor.

Perhaps the most important matter coming before the meeting of the association was the report made at the morning session of the third day by Mr. Fletcher, on behalf of the committee on co-operative cataloguing, — a scheme which received some notice in *Science* a few weeks ago. The object in view is the preparation and printing of such catalogues, bibliographic guides, and indexes as shall serve to relieve the several libraries of a large share of the expense of the present system of publishing expensive individual catalogues. The committee had received replies from some seventy different libraries, favoring the organization of a publishing section of the association, after the pattern of the early English text and the Shakspeare societies. The association next heard the reading of a paper on 'Library buildings,' prepared by Mr. Eirikr Magnússon (Cambridge, England, university library), advocating the Archimedean spiral as the form most suitable for the library structure of the future. This plan was illustrated in the London *Athenaeum* some months ago, and may fairly be conceded to present certain advantages; viz., a maximum of book-space with a minimum of material used in construction, the possibility of enlargement of the original structure perpetually as required, without disturbing in the least the operations of the central library or its functions. But the association, while extending a cordial vote of thanks to Mr. Magnússon for his paper, was entirely unanimous in condemning his proposed library. In particular, Dr. Poole said the idea was substantially an old one, rejected long ago, and that the enforced sky-light for the book-stacks was a very serious disadvantage. Other members criti-

cised the proposed building on the ground of supposed structural weakness, the unavoidable darkness of the stack when its roof might be under deep snows, and the impossibility of thorough ventilation, as no side windows or apertures could be provided.

The subject of the electric lighting and heat-regulation in libraries was next taken up, Dr. Poole relating his experience with both gas and electricity, and characterizing the latter as a luxury which none but the wealthier libraries could afford; while Mr. Dewey pronounced unequivocally in favor of electricity from experience with the Edison incandescent system in the new Columbia college library. Its absence of heat is greatly in its favor in the summer illumination of libraries; it gives off no products of combustion which, like gas, may injure the bindings of the finer volumes; and Mr. Dewey had found many people coming into the library to read by the electric light who were sufferers from eye-troubles if they tried to read by gas, or even petroleum illumination. No member of the association, however, could give precise information of the relative cost of gas and electric light, owing to the running of the dynamos for steam boilers used for other purposes. In recent issues of *Science*, the results of English experiments in this direction placed the electric light at very great disadvantage in point of expense, and made it cost at present about twice as much as gas. Mr. Cutter (Boston athenaeum) and Mr. Linderfelt (Milwaukee public library) explained the action of the apparatus employed in their libraries for the automatic regulation of the heat-supply, and pronounced it thoroughly satisfactory. The system involves the electric control of the registers and the openings in the windows, and is found to be competent to maintain the rooms at any desired temperature for which the indicator is easily set, as well as to effect a considerable saving of fuel. A delegate from Kansas said, that in his region natural gas is used over a large area, furnishing the library with both heat and light.

The other papers presented at the Friday session were by Mr. Woodruff (Cornell university library), on 'The relation of university seminaries to the university library;' and by Mr. Utley of Detroit, on 'The relation of the public library to the public schools,' in which it was stated that the supreme court of Michigan had ruled that the library is a part of the apparatus of the school, and the plan of reading and discussing the books in the schools during recitation hours had given admirable results. A vigorous discussion of the subject of binding books in libraries ensued; and the third day's session closed with the adoption of a resolution commending to states and institutions the trial of a plan for the collection and redistribution of documents, which had succeeded admirably under the direction of the secretary of the interior.

The untransacted business of the meeting necessitated a session on the fourth day (Saturday), when Mr. Green of the committee on public documents presented a report embodying the bill, now in the hands of the senate committee on printing, which will instruct the public printer to deliver to the interior department a sufficient number of copies of every government publication to enable every depositary of public documents to receive one. The measure is ably supported by Senator Hoar, for whom a vote of thanks was passed by the association. Mr. Green's report provoked animated discussion, and was followed by a paper by Mr. J. Schwartz (Apprentices' library, New York), which was mainly a satire on various prevailing systems of classification.

The secretary read a thoughtful paper on bibliography in general, and especially on the bibliography of the literature of science, by Mr. Mann of Washington, who remarked first the rapid rate of increase within the last few years of the application of bibliography to the work of the student of science — who is, nevertheless, apt to set too little value upon the refinements of the art of bibliography. The necessity of providing some method of indexing is the first lesson to be learned in the making of a useful bibliography, and such index should be very detailed. To secure the advantages of a condensed method of reference, some symbolism should be employed. The usual method of making citations in scientific writings is to refer to individual or separate works by the name of author, title, and page; to articles in periodicals by title of periodical, date (sometimes), and page. A very useful device is to give in a preface or appendix a list of all the works cited, with some symbol attached, and to refer to this symbol whenever references are to be made. Some authors have undertaken to accept some bibliography, the catalogue of the Royal society, for instance, as a standard, and to refer to the symbols employed in that; but there are many difficulties in the way of its use as such. Mr. Mann regards the arrangement of titles in a current bibliography as a matter of very little consequence. Nothing should be allowed to interfere with the practice of appending to each title a current numeral, the series of which should be continuous from volume to volume. As an aid to scientific investigation, the works enumerated in a bibliography should be analyzed, this analysis indicating the special phase of the subject treated

in the work. Difficult analyses should be made by specialists. Each title in the bibliography should be confined as closely as possible to a single subject, even to the extent of entering the several chapters of the work as separate titles whenever they treat of distinct subjects. The whole work may be integrated under its own title by giving the list of its chapters in the analysis of the work itself.

Aside from its cost, the principal difficulty in the preparation of a bibliography like that described lies in getting any person or persons to undertake the labor and responsibility of writing or editing the work. The magnitude of the task is apparent. If, however, the work can be issued as a current bibliography, with no regard to the order of titles or the connection of subjects, making use only of such material as may be available at the time, and attaching to each title a current number to serve for reference from an index, no editor need feel oppressed with the magnitude of his task. Whatever is done will be a step in the right direction; and the work may, if need be, temporarily be abandoned, without a loss in value of what has already been accomplished. It is only necessary that the titles of chapters and articles be given accurately, and that the analytical references be made fully; while the rest may be left to others who for their own purposes will make indexes to take the place of any special analyses of contents.

The publishing section was duly organized before final adjournment, and this move on the part of the association is of the first importance. The section will begin at once the publication of indexes to scientific and other essays, and prosecute whatever work may be found practicable in the line of co-operative bibliography.

The association were handsomely received and entertained by the mayor, the Hon. Emil Wallber, and citizens of Milwaukee; and the success of the meeting was largely secured through the exertions of Mr. K. A. Linderfelt of the Milwaukee public library. On Monday, the 12th, the association left Milwaukee for an eight-day excursion in northern Wisconsin.

The officers elected for the ensuing year are, president, Dr. Poole; vice-presidents, Mr. Spofford (Library of congress), Judge Mellen Chamberlain (Boston public library), and Mr. W. E. Foster (Providence public library); secretary, Prof. Melvil Dewey; assistant secretary, Mr. Richardson; treasurer, Mr. Carr of Grand Rapids.

At the conclusion of its last session, the association was adjourned to meet at the Thousand Islands, in the second week of September, 1887.

DAVID P. TODD.

HONOLULU LETTER.

THE Sandwich or Hawaiian Islands, situated about 2,000 miles to the south-west of San Francisco, are commonly reckoned at twelve in number, four of them ranging from 500 to 3,950 square miles in area, and the entire group amounting to 6,040 square miles. On examining a good chart of the Pacific Ocean, one finds a row of small islands and shoals having the same trend with, and being really a north-westerly extension of, the Hawaiian group. There are fourteen of these in addition to those usually styled the Sandwich Islands, twelve of which are claimed by the Hawaiians, while the two most remote belong to the United States, and are known as Midway and Ocean Islands. The U. S. government is said to have expended $100,000 in improving the harbor of Midway Island, and coal is stored here also for the benefit of our war vessels and Japanese steamers. It would appear that this harbor has not answered expectations, and consequently negotiations have been commenced with reference to the cession to the United States of certain privileges at the Pearl Harbor district near Honolulu.

Two diverse theories meet us in the attempt to explain the origin of this extensive chain, between the meridians of 154° 30′ and 180°, and 1,725 miles in length. They are cones rising from a submarine plateau 16,000 to 18,000 feet below the surface. One view is that they are of volcanic origin, commencing as submarine volcanoes, and built up of their own ejecta, even to the height of 14,000 feet above the sea-level. The smaller ones are atolls, and are usually encircled by coral reefs; so that, after their original volcanic start, they must have been submerged for the accumulation of the organic growth. The other view ascribes their origin to an enormous subsidence, the several islands being supposed to be the summits of mountains, the apices of an ancient continent, capped by coral growth. If these were once a continent, we understand why the flora should be so much diversified, since the plants would be driven to the uplands by the gradual subsidence. In the same way it is easy to see how the Hawaiians themselves might have made their way here from the East Indies. The Hawaiian government has established a genealogical bureau at an annual cost of $5,000, which devotes much attention to the early continental condition of the kingdom, as well as the study of the ancestors of the royal family.

Wallace accepts the former of these theories, and finds, from a study of the plants and animals, affinities with America, New Zealand, and Australia, the relation to the first being the most re-