ing academies of Indiana, Michigan and Illinois. Nevertheless, it collects $1,300 annually, about $400 more than any other academy. The secretary of the Ohio Academy assures me that the dues do not keep people out of the academy. The Kentucky Academy, with dues of $2.50, has a membership only 40 per cent. as large as that of the Tennessee Academy, with $2.00 dues. I believe that dues of $2.50 are too high for most academies. I am inclined to think, however, that an academy providing its members with a fair-sized publication may well have dues of $1.50 to $2.00. When no publication is given to members, I do not think an academy should have dues of more than $2.00.

I do not favor any reduction of academy dues to members of the American Association. Such members are usually the most interested and demand no bargain price, but count it a privilege to support the academy. The reduction makes confusion in billing and recording. The change from 50 cents to $1.00 for A. A. A. S. members of the Kansas Academy, I am sure, kept no one from joining the academy.

At least three academies charge an initiation fee of $1.00, and the Illinois Academy has an annual income of $200 from this source. New Hampshire has an initiation fee of $2.00. There appears to be no evidence that an initiation fee of $1.00 holds back any one who wishes to join. On the other hand, this requirement probably helps to hold members who might drop out at the end of a year. A $2.00 initiation fee is probably too high for most academies.

The annual academy allowances received from the American Association (50 cents a year for each member of both organizations) range in amount from about $25 to about $170. One of the affiliated academies (Maryland) does not take the allowance. Eleven consider that a discontinuance of the allowance would seriously handicap their work. Five failed to answer an inquiry on this point, or were not sure, and four of the smaller academies did not think their work would be injured if the allowance were not received. Although the allowance is certainly a real help to academies that do not have state aid, yet I think it would be well for each academy to try to devise means for adequate support from other sources, so as not to be seriously embarrassed if the association should find it impossible to continue the allowances.

Life membership fees in the academies vary from $15 to $100, being usually between $25 and $50, paid at one time. Only in the Kansas Academy and in the Tennessee Academy are former dues credited towards life membership. In the Kansas Academy the life membership fee was recently increased from $20 to $30, but most of the life memberships have been secured by the payment of annual dues for 20 years. While life memberships may in some cases be a burden to an academy, if the fee is low and life members receive the academy publication free, they might yield considerable income if the fee were collected as a single payment and placed in an endowment fund.

The St. Louis Academy receives an annual income of about $1,200 from endowment and rents. The Virginia Academy has a permanent fund of $9,000, the proceeds of which are used to aid research. Several academies have savings that yield annual incomes of from $150 to $175. Endowment may well become an important source of income for academies in the future. Bequests by members and others might be encouraged.

Some revenue may sometimes be secured by academies from the sale of current volumes of their publication to libraries and non-members, and also from the sale of complete sets. Such sales were reported by a number of the academies represented in this conference.

Another source of income to academies, thus far almost untouched, is the sale of reprints from the academy publication at above their actual cost. Each author would usually purchase a number of reprints of his article, and important contributions might sell otherwise. We pay 50 cents a page for 200 reprints in Kansas. Our first year we charged each author $2.50 a page, which covered most of the cost of that volume of the *Transactions*, a book of 281 pages. Since then we have sold the reprints at almost cost plus half the price of the cuts. A charge of 75 cents or $1.00 a page for 200 reprints may prove to be quite feasible.

THE TEMPLETON CROCKER EXPEDITION OF THE CALIFORNIA ACADEMY OF SCIENCES

By G. DALLAS HANNA

CALIFORNIA ACADEMY OF SCIENCES

THIS expedition sailed from San Francisco on the yacht *Zaca*, under the direction of Mr Crocker and under the auspices of the California Academy of Sciences. The interval between March 10 and September 1, 1932, was spent in making zoological and botanical investigations from San Francisco south as

far as the Galapagos Islands and return. The entire cruise covered 9,046 miles.

The primary object of the expedition was the making of detailed collections in the Galapagos Islands, with particular attention being paid to botany, ichthyology and ornithology. The members of the party were highly successful in these branches, having reached such difficult localities as the rain forest at the top of Indefatigable Island; apparently no previous expedition had succeeded in reaching that point.

On the way to and from the Galapagos, visits were made to various places on the west coast of Mexico and Central America and also Cocos Island, the Tres Marias Islands, the Revillagigedo Islands, Cedros Island, Guadalupe Island and San Nicolas Island.

Dredging stations were occupied at 168 localities and much attention was given to this method of collecting. A wealth of material was obtained at some of the most celebrated localities of western America, such as Cape San Lucas, Acapulco, Gulf of Fonseca, etc. Many of the stations were located where no previous work had been done. The greatest depth which was reached by the equipment was 250 fathoms.

The ship was provided with tanks for transporting fishes alive, and 331 specimens were brought from tropical waters for exhibition in the Steinhart Aquarium. About one third of the total catch was kept aboard successfully for over five months.

The California Academy of Sciences was represented by Mr. Harry S. Swarth, ornithologist, Mr. Robert J. Lanier and Mr. H. Walton Clark, marine zoologists, Mr. John Thomas Howell, botanist, and Mr. Maurice Willows, entomologist. Mr. Toshio Asaeda accompanied the expedition as artist and photographer and, under Mr. Crocker's personal direction, made over 200 water color paintings of fishes, crustaceans and other marine life; he also took 1,300 still pictures. Dr. Albert E. Larsen, physician, paid special attention to the making of plankton collections for the University of California. Captain Garland Rotch was largely responsible for the construction and operation of the dredges and trawls and took several thousand feet of motion-picture film. All members of the crew joined whole-heartedly in the manifold duties of such an expedition, and much of the success attained is directly attributable to this cooperation. Mr. Crocker became general assistant in all activities where help was needed.

The manner in which this expedition was organized and conducted affords an excellent example of converting what ordinarily might be a pleasant but prosaic yachting trip into a cruise which yielded results of great interest and permanent scientific value. After all, much of the future exploration of the ocean and oceanic islands must necessarily be done by such men who have the means and the interest to carry out similar projects successfully.

Preliminary statements regarding the collections obtained have been furnished as follows by the curators of the various departments of the academy.

Botany: About 3,000 specimens of plants (not including duplicates) were obtained. Some species of flowering plants from the Galapagos had not previously been collected since the visit of Charles Darwin in the *Beagle*. Over 100 specimens of cacti were obtained, 40 of which are from the Galapagos; these latter are expected to serve as a basis of a critical study of the species found there. Over 200 species of marine algae were obtained at the Galapagos, and additional large collections were obtained from Lower California and other places where dredging was done. A large number of Hepaticae with smaller numbers of mosses and fungi were obtained in the tropical rain forests of the Galapagos Islands and Cocos Island.

Entomology: Although no trained entomologist accompanied the expedition, a very considerable number of insects was taken by the staff, mostly by Mr. Maurice Willows, who was assigned to this duty by Mr. Crocker. The collections of Hemiptera and Diptera from the Galapagos are of special interest because these groups were largely neglected by the academy's expedition of 1905–1906.

Fishes: A very large collection of fishes was obtained by all the usual means employed in such work except explosives. Special attention was paid to tide pools and the use of a submarine light. Some excellent species were obtained in deep water with the dredges and trawls.

Herpetology: Since most of the localities visited had been previously explored by herpetologists, less attention was given to this branch of study than some others. However, a snake was obtained on Duncan Island of the Galapagos, the second ever taken there. Several sea snakes were taken along the Central American coast.

Paleontology: Fossils were obtained on Clarion Island of the Revillagigedo Group for the first time. Except for one brief note, this island was previously supposed to be wholly volcanic. Fossils were also collected at several points in the Galapagos Islands at localities additional to those which were made known by the academy expedition of 1905–1906. The large amount of dredging which was done resulted in the bringing together of a huge collection of marine shells. Excellent specimens of *Xenophora* were obtained along the Central American coast; the genus has apparently hitherto been obtained but once from western North America. Five specimens of a striking jet black *Mitra* (not *belcheri*) fully five inches long were dredged off the coast of Lower California.

Brachiopoda, Echinoidea, Asteroidea, sponges, corals and many Crustacea were collected in large numbers and at many places.

Aquarium: The tanks on the deck of the *Zaca* were equipped for constant circulation of sea water. By means of heating apparatus it was possible to bring the tropical forms alive from as far south as the Galapagos to San Francisco. Many of the gaudily colored fishes from warm waters seem to lose some of their brilliance when placed in the aquarium, although otherwise they appear normal in every way. Except for the anxiety caused by the possible failure of the water circulation system the transportation of living fishes aboard ship involves no very great difficulty and apparently imposes no special hardship on the fishes themselves. Those carried on the *Zaca* consumed 640 pounds of food during the cruise.

Ornithology: A collection of about 400 specimens of birds was brought back by the expedition. By far the greatest number was taken on the Galapagos Islands where special effort was made to select certain species or particular plumages to fill out the academy's series. One species of finch not known since the time of Charles Darwin and supposed to be extinct was found to have survived on some of the islands. The birds of these islands are of exceptional interest, not only because of their many remarkable peculiarities, but because the study of them was largely responsible for the formulation of Darwin's theory of evolution. By the use of the freezing equipment installed aboard the ship, Mr. Crocker was able to bring back numerous birds in the flesh. These were taken after the departure of the ornithologist.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

HOTEL HEADQUARTERS AT ATLANTIC CITY

THE ninety-first meeting of the association will be held at Atlantic City from Tuesday, December 27, to Saturday, December 31. This will be a quadrennial convocation meeting, which would normally have been held at Chicago. A meeting in Chicago was, however, postponed until June in order to cooperate with the Century of Progress Exposition. Forty-one scientific societies plan to hold meetings with the association at Atlantic City. Several societies will meet for the first time with the association. Others, which have not met with the association since the New York meeting of 1928, will be present at Atlantic City.

Dr. Franz Boas, retiring president of the association, will deliver the opening general address on a subject in anthropology. The first Maiben Lecture, a new lecture established in memory of the late Hector Maiben, of Lincoln, Nebraska, will be delivered by Dr. Henry Norris Russell, of Princeton University, on "The Constitution of the Stars." Dean Dexter S. Kimball will deliver an evening address on "The Social Effects of Mass Production." Other general addresses will be given by Dr. O. H. Caldwell, formerly U. S. radio commissioner, Dr. Dayton C. Miller, Dr. Mel T. Cook, Dr. Richard C. Tolman (Gibbs Lecture), Dr. Russell W. Bunting and Dr. C. C. Speidel. Practically all the fifteen retiring vice-presidents of the association will deliver addresses of somewhat general interest.

A number of sections and societies are planning important symposia. Dr. John J. Abel, president of the association, is organizing one for discussion of "The Physiological Relations of the Pituitary Body." Sections K (Economics, Sociology and Statistics) and M (Engineering) are organizing a symposium on "The Stabilization of Employment." Further details about symposia and meetings of societies and sections will be given in subsequent numbers of SCIENCE.

HOTEL HEADQUARTERS

General headquarters for the association will be at Chalfonte-Haddon Hall, which is located on the board walk. Rates quoted for rooms, single occupancy, American plan (with meals), are $5.00 to $9.00 without bath and $7.00 to $10.00 with bath. For single occupancy, rooms with bath on the European plan (without meals) are listed at $3.00 to $6.00. Rooms with private bath for double occupancy (two persons), are quoted at $12.00 to $18.00, American plan, and $5.00 to $10.00, European plan.

Names of societies holding meetings, dates of meetings and hotel headquarters are given below. The dates for section meetings include the meeting dates of all associated societies. Unless otherwise stated, the hotel headquarters for the societies are the same as for the section under which they are listed. Minimum special hotel rates per person for two in a room, European plan, are quoted. For American plan rates (with meals) add $2.00 to $3.00 extra.

SECTION A (MATHEMATICS): December 27 to 30; Hotel Morton, $2.00 without bath. American Mathematical Society, December 27 to 30; Mathematical Association of America, December 27 to 28.

SECTION B (PHYSICS): December 27 to 31; Ambassador Hotel, $3.00 with bath. American Physical Society,