falls. The meetings at Chicago of the Council of the American Association for the Advancement of Science and of the American Society of Naturalists and affiliated societies consequently mark the establishment of convocation week. This fact alone should make the approaching meeting one of unusual importance, and we desire once more to urge upon all naturalists who can possibly do so, and especially those in the east, the duty as well as the privilege of attending the Chicago meeting.

EXTRACTS FROM PRESIDENT ROOSEVELT'S MESSAGE TO THE CONGRESS.

A SECRETARY OF COMMERCE AND INDUSTRIES.

THERE should be created a cabinet officer, to be known as secretary of commerce and industries, as provided in the bill introduced at the last session of the Congress. It should be his province to deal with commerce in its broadest sense, including among many other things whatever concerns labor and all matters affecting the great business corporations and our merchant marine. The course proposed is one phase of what should be a comprehensive and far-reaching scheme of constructive statesmanship for the purpose of broadening our markets, securing our business interests on a safe basis, and making firm our new position in the international industrial world; while scrupulously safeguarding the rights of wage-worker and capitalist, of investor and private citizen, so as to secure equity as between man and man in this republic.

THE PACIFIC CABLE.

I call your attention most earnestly to the crying need of the cable to Hawaii and the Philippines, to be continued from the Philippines to points in Asia. We should not defer a day longer than necessary the construction of such a cable. It is demanded not merely for commercial but for political and military considerations. Either the Congress should immediately provide for the construction of a Government cable, or else an arrangement should be made by which like advantages to those accruing from a Government cable may be secured to the Government by contract with a private cable company.

THE ISTHMIAN CANAL TREATY.

No single great material work which remains to be undertaken on this continent is of such consequence to the American people as the building of a canal across the Isthmus connecting North and South America. Its importance to the nation is by no means limited merely to its material effects upon our business prosperity; and yet with a view to these effects alone it would be to the last degree important for us immediately to begin it. While its beneficial effects would perhaps be most marked upon the Pacific coast and the Gulf and south Atlantic States, it would also greatly benefit other sections. It is emphatically a work which it is for the interest of the entire country to begin and complete as soon as possible; it is one of those great works which only a great nation can undertake with prospects of success, and which, when done, are not only permanent assets in the nation's material interests, but standing monuments to its constructive ability.

THE SMITHSONIAN INSTITUTION.

The advancement of the highest interests of national science and learning and the custody of objects of art and of the valuable results of scientific expeditions conducted by the United States have been committed to the Smithsonian Institution. In furtherance of its declared purpose—for the 'increase and diffusion of knowledge

among men'—the Congress has from time to time given it other important functions. Such trusts have been executed by the institution with notable fidelity. There should be no halt in the work of the institution, in accordance with the plans which its secretary has presented, for the preservation of the vanishing races of great North American animals in the National Zoological Park. The urgent needs of the National Museum are recommended to the favorable consideration of the Congress.

THE LIBRARY OF CONGRESS.

Perhaps the most characteristic educational movement of the past fifty years is that which has created the modern public library and developed it into broad and active service. There are now over five thousand public libraries in the United States, the product of this period. In addition to accumulating material, they are also striving, by organization, by improvement in method and by cooperation, to give greater efficiency to the material they hold, to make it more widely useful, and by avoidance of unnecessary duplication in process to reduce the cost of its administration. In these efforts they naturally look for assistance to the Federal Library, which, though still the Library of Congress, and so entitled, is the one national library of the United States. Already the largest single collection of books on the Western Hemisphere, and certain to increase more rapidly than any other through purchase, exchange and the operation of the copyright law, this library has a unique opportunity to render to the libraries of this country—to American scholarship—service of the highest importance. It is housed in a building which is the largest and most magnificent yet erected for library uses. Resources are now being provided which will develop the collection properly, equip it with apparatus and service necessary to its effective use, render its bibliographic work widely available, and enable it to become not merely a center of research, but the chief factor in great cooperative efforts for the diffusion of knowledge and the advancement of learning.

A PERMANENT CENSUS BUREAU.

For the sake of good administration, sound economy and the advancement of science, the Census Office as now constituted should be made a permanent Government bureau. This would insure better, cheaper and more satisfactory work, in the interest not only of our business, but of statistic, economic and social science.

THE DEPARTMENT OF AGRICULTURE, FORESTRY AND IRRIGATION.

The Department of Agriculture during the past fifteen years has steadily broadened its work on economic lines, and has accomplished results of real value in upbuilding domestic and foreign trade. It has gone into new fields until it is now in touch with all sections of our country and with two of the island groups that have lately come under our jurisdiction, whose people must look to agriculture as a livelihood. It is searching the world for grains, grasses, fruits and vegetables specially fitted for introduction into localities in the several states and territories where they may add materially to our resources. By scientific attention to soil survey and possible new crops, to breeding of new varieties of plants, to experimental shipments, to animal industry and applied chemistry, very practical aid has been given our farming and stock-growing interests. The products of the farm have taken an unprecedented place in our export trade during the year that has just closed.

Public opinion throughout the United States has moved steadily toward a just appreciation of the value of forests, whether

planted or of natural growth. The great part played by them in the creation and maintenance of the national wealth is now more fully realized than ever before. Wise forest protection does not mean the withdrawal of forest resources, whether of wood, water or grass, from contributing their full share to the welfare of the people, but, on the contrary, gives the assurance of larger and more certain supplies. The fundamental idea of forestry is the perpetuation of forests by use. Forest protection is not an end of itself; it is a means to increase and sustain the resources of our country and the industries which depend upon them. The preservation of our forests is an imperative business necessity. We have come to see clearly that whatever destroys the forest, except to make way for agriculture, threatens our well-being.

The practical usefulness of the national forest reserves to the mining, grazing, irrigation and other interests of the regions in which the reserves lie has led to a widespread demand by the people of the West for their protection and extension. The forest reserves will inevitably be of still greater use in the future than in the past. Additions should be made to them whenever practicable, and their usefulness should be increased by a thoroughly businesslike management. At present the protection of the forest reserves rests with the General Land Office, the mapping and description of their timber with the United State Geological Survey, and the preparation of plans for their conservative use with the Bureau of Forestry, which is also charged with the general advancement of practical forestry in the United States. These various functions should be united in the Bureau of Forestry, to which they properly belong. The present diffusion of responsibility is bad from every standpoint. It prevents that effective cooperation between the Government and the men who utilize the resources of the reserves without which the interests of both must suffer. The scientific bureaus generally should be put under the Department of Agriculture. The President should have by law the power of transferring lands for use as forest reserves to the Department of Agriculture. He already has such power in the case of lands needed by the Departments of War and the Navy.

The wise administration of the forest reserves will be not less helpful to the interests which depend on water than to those which depend on wood and grass. The water supply itself depends upon the forest. In the arid region it is water, not land, which measures production. The western half of the United States would sustain a population greater than that of the whole country to-day if the waters that now run to waste were saved and used for irrigation. The forest and water problems are perhaps the most vital internal questions of the United States.

Certain of the forest reserves should also be made preserves for the wild forest creatures. All the reserves should be better protected from fires. Many of them need special protection because of the great injury done by live stock, above all by sheep. The increase in deer, elk and other animals in the Yellowstone Park shows what may be expected when other mountain forests are properly protected by law and properly guarded. Some of these areas have been so denuded of surface vegetation by overgrazing that the ground breeding birds, including grouse and quail, and many mammals, including deer, have been exterminated or driven away. At the same time the water-storing capacity of the surface has been decreased or destroyed, thus promoting floods in times of rain and diminishing the flow of streams between rains.

In cases where natural conditions have been restored for a few years, vegetation

has again carpeted the ground, birds and deer are coming back, and hundreds of persons, especially from the immediate neighborhood, come each summer to enjoy the privilege of camping. Some at least of the forest reserves should afford perpetual protection to the native fauna and flora, safe havens of refuge to our rapidly diminishing wild animals of the larger kinds, and free camping grounds for the ever-increasing numbers of men and women who have learned to find rest, health and recreation in the splendid forests and flower-clad meadows of our mountains. The forest reserves should be set apart forever for the use and benefit of our people as a whole, and not sacrificed to the short-sighted greed of a few.

The forests are natural reservoirs. By restraining the streams in flood and replenishing them in drought they make possible the use of waters otherwise wasted. They prevent the soil from washing, and so protect the storage reservoirs from filling up with silt. Forest conservation is therefore an essential condition of water conservation. The forests alone cannot, however, fully regulate and conserve the waters of the arid region. Great storage works are necessary to equalize the flow of streams and to save the flood waters. Their construction has been conclusively shown to be an undertaking too vast for private effort. Nor can it be best accomplished by the individual states acting alone. Far-reaching interstate problems are involved; and the resources of single states would often be inadequate. It is properly a national function, at least in some of its features. It is as right for the National Government to make the streams and rivers of the arid region useful by engineering works for water storage as to make useful the rivers and harbors of the humid region by engineering works of another kind. The storing of the floods in reservoirs at the headwaters of our rivers is but an enlargement of our present policy of river control, under which levees are built on the lower reaches of the same streams.

The Government should construct and maintain these reservoirs, as it does other public works. Where their purpose is to regulate the flow of streams, the water should be turned freely into the channels in the dry season to take the same course under the same laws as the natural flow. The reclamation of the unsettled arid public lands presents a different problem. Here it is not enough to regulate the flow of streams. The object of the government is to dispose of the land to settlers who will build homes upon it. To accomplish this object water must be brought within their reach. The pioneer settlers on the arid public domain chose their homes along streams from which they could divert the water to reclaim their holdings. Such opportunities are practically gone. There remain, however, vast areas of public land which can be made available for homestead settlement, but only by reservoirs and main-line canals impracticable for private enterprise. These irrigation works should be built by the National Government. The lands reclaimed by them should be reserved by the Government for actual settlers, and the cost of construction should so far as possible be repaid by the land reclaimed. The distribution of the water, the division of the streams among irrigators, should be left to the settlers themselves in conformity with state laws and without interference with those laws or with vested rights. The policy of the National Government should be to aid irrigation in the several states and territories in such manner as will enable the people in the local communities to help themselves, and as will stimulate needed reforms in the state laws and regulations governing irrigation.

The reclamation and settlement of the arid lands will enrich every portion of our country, just as the settlement of the Ohio and Mississippi valleys brought prosperity to the Atlantic States. The increased demand for manufactured articles will stimulate industrial production, while wider home markets and the trade of Asia will consume the larger food supplies and effectually prevent western competition with eastern agriculture. Indeed, the products of irrigation will be consumed chiefly in upbuilding local centers of mining and other industries, which would otherwise not come into existence at all. Our people as a whole will profit, for successful homemaking is but another name for the upbuilding of the nation.

The necessary foundation has already been laid for the inauguration of the policy just described. It would be unwise to begin by doing too much, for a great deal will doubtless be learned, both as to what can and what cannot be safely attempted by the early efforts, which must of necessity be partly experimental in character. At the very beginning the Government should make clear, beyond shadow of doubt, its intention to pursue this policy on lines of the broadest public interest. No reservoir or canal should ever be built to satisfy selfish personal or local interests; but only in accordance with the advice of trained experts, after long investigation has shown the locality where all the conditions combine to make the work most needed and fraught with the greatest usefulness to the community as a whole. There should be no extravagance, and the believers in the need of irrigation will most benefit their cause by seeing to it that it is free from the least taint of excessive or reckless expenditure of the public moneys.

Whatever the nation does for the extension of irrigation should harmonize with, and tend to improve, the condition of those now living on irrigated land. We are not at the starting point of this development. Over two hundred millions of private capital has already been expended in the construction of irrigation works, and many million acres of arid land reclaimed. A high degree of enterprise and ability has been shown in the work itself; but as much cannot be said in reference to the laws relating thereto. The security and value of the homes created depend largely on the stability of titles to water; but the majority of these rest on the uncertain foundation of court decisions rendered in ordinary suits at law. With a few creditable exceptions, the arid states have failed to provide for the certain and just division of streams in times of scarcity. Lax and uncertain laws have made it possible to establish rights to water in excess of actual uses or necessities, and many streams have already passed into private ownership, or a control equivalent to ownership.

Whoever controls a stream practically controls the land it renders productive, and the doctrine of private ownership of water apart from land cannot prevail without causing enduring wrong. The recognition of such ownership, which has been permitted to grow up in the arid regions, should give way to a more enlightened and larger recognition of the rights of the public in the control and disposal of the public water supplies. Laws founded upon conditions obtaining in humid regions, where water is too abundant to justify hoarding it, have no proper application in a dry country. In the arid states the only right to water which should be recognized is that of use. In irrigation this right should attach to the land reclaimed and be inseparable therefrom. Granting perpetual water rights to others than users, without compensation to the public, is open to all the objections which apply to giving away perpetual franchises to the public

utilities of cities. A few of the Western states have already recognized this, and have incorporated in their constitution the doctrine of perpetual state ownership of water.

The benefits which have followed the unaided development of the past justify the nation's aid and cooperation in the more difficult and important work yet to be accomplished. Laws so vitally affecting homes as those which control the water supply will only be effective when they have the sanction of the irrigators; reforms can only be final and satisfactory when they come through the enlightenment of the people most concerned. The larger development which national aid insures should, however, awaken in every arid state the determination to make its irrigation system equal in justice and effectiveness that of any country in the civilized world. Nothing could be more unwise than for isolated communities to continue to learn everything experimentally, instead of profiting by what is already known elsewhere. We are dealing with a new and momentous question, in the pregnant years while institutions are forming, and what we do will affect not only the present, but future generations.

Our aim should be not simply to reclaim the largest area of land and provide homes for the largest number of people, but to create for this new industry the best possible social and industrial conditions; and this requires that we not only understand the existing situation, but avail ourselves of the best experience of the time in the solution of its problems. A careful study should be made, both by the nation and the States, of the irrigation laws and conditions here and abroad. Ultimately it will probably be necessary for the nation to cooperate with the several arid states in proportion as these states by their legislation and administration show themselves fit to receive it.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SECTION I, SOCIAL AND ECONOMIC SCIENCE.

Officers for the Denver meeting were: *Vice-President*, John Hyde; *Secretary*, Raymond A. Pearson; *Member of Council*, E. T. Peters; *Sectional Committee*, C. M. Woodward, H. T. Newcomb, John Hyde, R. A. Pearson, Marcus Benjamin, F. R. Rutter and L. F. Schmeckebier; *Member of the General Committee*, F. H. Hitchcock.

Nine meetings were held and at each a full program was presented. Unusual interest in some papers was shown by the discussions. The average attendance was probably the largest in the history of the Section. The majority of papers treated of subjects which are of special interest in the West—one entire day, including an evening session, being given to the consideration of the economic and social aspects of irrigation.

The vice-presidential address of Professor C. M. Woodward, 'The Change of Front in Education,' was published in full in a recent number of Science. Other papers were as follows:

'Scientific Men of Colorado': Dr. Marcus Benjamin, Washington, D. C.

This paper had for its purpose the presentation to the Section of the records of various scientific men of Colorado, and consisted chiefly of summaries of the excellent work done by the graduates of the Scientific Department of Columbia University, formerly known as the School of Mines, towards the development of the mineral resources of Colorado, as well as of the improved methods in metallurgical science invented by them. The sketches were some twenty in number and included the careers of such men as M. W. Iles, M. C. Ihlseny, W. B. Devereux, H. V. Furman and Richard Pearce. Brief mention was also made of such scientists as the late Senator N. P. Hill, who was referred to as the only chemist ever elected to the United States