removed from man to his activities. Man progresses, not by struggling for existence, but by means of his pursuit of happiness. Animals live each for itself: man cannot live for himself alone. When animals were domesticated, a great step in advance was taken. By this means, and by the introduction of agriculture, the gens was broken up, and the matriarchal system changed to a patriarchal. Another great step was taken when metallurgical processes were discovered; then civilization was reached. Owing to the lateness of the hour, Major Powell omitted a large part of his most interesting paper. Speaking, as he did, with the earnestness of intense conviction, he bore his audience from argument to argument in a masterly manner; and many warm expressions of approval were bestowed upon the author.

The opening paper on Wednesday morning, by Mrs. Erminnie Smith, discussed in a very original manner the formation of Iroquois words. She very pertinently called attention to the fact, that most students of Iroquois had contented themselves with collating lists of words, while the more thorough and useful method would involve a search for roots by analyzing words; and the author had proceeded in this way, and as a result made many curious discoveries. Certain errors in dictionaries of the language were pointed out. The Tuscarora language, she thinks, affords a key to the dialects of the other six nations. Examples illustrating the formation and origin of many words were given. The literal meaning of many words in common use is very curious: for example, tears are, literally, eye-juice; whiskey, deformed water; agony, he eats up his life; a bank is a money-farm, — the principal is the mother, and the interest the baby. Birds are often named from their note, other animals from some physical peculiarity.

Following this was a long and most instructive paper by Dr. A. Graham Bell, upon a race of deaf-mutes in North America. Mr. Bell first called attention to the increasing prevalence of deaf-mutes in the United States. He showed that the increase of deaf-mutes was very much greater relatively than that of other classes. In order to open his argument, he asked the question, 'How can we in the most scientific manner establish a race of deaf-mutes?' In answer to this question, he showed that no more efficient means for the formation of such a race could be set in action than just those which, from the best of motives, philanthropy had used and was still using for the benefit (?) of these unfortunate people. The system of secluding deaf-mutes, so that they associated only with each other; teaching them a special language, so that they learn to think, not in English, but in a language as distinct from it as French or German, and thus lose largely their use of English, and cannot express themselves well in written English, — all this he strongly deprecated. He spoke of erroneous ideas respecting the deaf and dumb, which are more or less prevalent. In the education of deaf-mutes, Mr. Bell would follow a different course from that usually pursued. He would have this class of children educated in the constant company of children who can hear and speak, not reciting in the same classes, except in map-drawing and such subjects, but in rooms by themselves, and yet mingling with other children as much as possible. He would have deaf children learn to understand what was said to them, by watching the motion of the lips. He would, so far as might properly be done, discourage intermarriage between deaf-mutes. He would have all deaf-mutes taught articulation; for, only by making the attempt, can it be known who can and who cannot speak. Professor Gordon of the Deaf-mute college in Washington spoke at some length upon the subject of Dr. Bell's paper, agreeing with the author in many important points, but disagreeing with him in others. He thought the deaf-mutes less isolated, and the danger of forming an increasing race very much less, than did Professor Bell. He also strongly advocated the use of the sign language, at least in elementary classes: when older, the vernacular may well be used.

The first paper of the afternoon was by Rev. S. D. Peet, upon tribal and clan lines recognized among the emblematic mounds. Following this was a description of a hitherto undescribed sacrificial stone at San Juan Teotihuacan, by Mr. A. W. Butler. This is five feet and a half square at the top, and six feet high, very elegantly carved, the bulk of the stone being occupied by a gigantic human head. The closing papers were by Prof. E. S. Morse, who added still further to the already great mass of information which he has given us respecting the Japanese. The first paper, on archery in Japan, gave accounts of methods of arrow release and the use of the bow, giving many interesting facts. In his second paper, on the use of the plough in Japan, Professor Horse showed some of the forms of plough seen in Japan, and the manner in which they were used.

Thus closed a meeting which all the members of the section agreed had been one of the most successful ever held. The papers were, many of them, of great weight and permanent value, and must form a part of the standard literature of American ethnology and archeology. The discussions were especially notable because of the presence of eminent English anthropologists, as Dr. Tylor, Dr. Syle, and others, who freely took part, and added their store of facts and enthusiasm. Not only were professional anthropologists greatly delighted and stimulated by the series of meetings; but the large audiences which, in spite of the very great heat, daily gathered in the room assigned to section H, showed quite conclusively that some, at least, of the papers were of general interest.

PROCEEDINGS OF THE SECTION OF ECONOMIC SCIENCE AND STATISTICS.

The section met in the hall of the Historical society of Pennsylvania, Thursday morning, Sept. 4. Gen. John Eaton, commissioner of education, was vice-president; and Charles W. Smiley of the U. S. fish-commission, secretary. On and after Monday, Hon. Lewis H. Steiner of Frederick City, Md., acted as chairman of the section, Gen. Eaton having been

called away. The address of Gen. Eaton upon scientific methods and scientific knowledge in common affairs was well received by an audience of about fifty persons. Some of the more interesting papers were the following: —

Prof. E. B. Elliott read a paper on the credit of the United-States Government, and presented tables and formulas. He said that the credit of the government had been continually increasing, as shown by the reduced rate of interest required; the rate of interest realized to investors in the four and a half per cents having been but about 2.7 per cent during the past four months.

Miss Alice C. Fletcher of the Peabody museum presented a paper on lands in severalty to Indians, illustrated by experiences with the Omaha tribe. She spoke of the Indians' ideas of land and property; of the agriculture of the Omahas, their reservation, their uneasiness upon the land tenure of Indians, and the desirability of securing to them land in severalty. The Indian question was discussed by Dr. Steiner, Mr. Spencer Borden, Mr. T. B. Browning, and others.

Mr. J. B. Martin of London read a paper upon the future of the United States; this, being from an English point of view, was very interesting. He called attention to the rapidity with which the public lands are being taken up, and to the rapid increase in population, which he thinks will soon reach seventy-five millions. How shall this population be fed? With the lands all taken up, and with cultivation brought up to a par with the improved agriculture of England, he estimated the surplus to suffice for thirty-five millions. The development of American agriculture will have to depend on foreign markets for its products; and, as the experience of England and America has been that food-supply is regulative of population, it may be assumed that Great Britain will long supply a market for cheap American food-products. But, meanwhile, the urban population is growing relatively to the country population; and this fact may be expected to exercise a retarding influence on the development of agriculture. The condition of the public debt was remarked upon as without parallel elsewhere. The debt charge has decreased to one-fifth the public revenue, while that of Great Britain is one-third the total revenue. With a debt entirely manageable, and with charges for naval and military purposes merely nominal, the nation will be able to develop itself under the most favorable conditions ever witnessed in the world. But the opportunity for capitalists to invest in public bonds failing, and the exceedingly low rate of interest, he regarded as ominous, and as likely to produce low wages, low prices generally, cheaper raw material, cheaper production, and close competition. The impossibility of spending the national revenue will cause a reduction of customs duties. With increase of population, and diffusion of wealth, the accumulation of individual fortunes will become more difficult, 'corners' less frequent, and time be found for literature, science, and art. He anticipates a gradual federation of state rights, increased intercommunication, perpetual shifting of population from state to state, — all tending to a complete amalgamation in one federal republic.

Mr. Thomas Hampson of the bureau of education read a paper on the apprenticeship question and industrial schools. He maintained that the apprenticeship system does not provide an adequate supply of workmen, and that it cannot be modified so as to do so. He, therefore, would substitute scientific for literary studies in the common schools, and establish manual-labor schools everywhere. Mr. C. M. Woodward, principal of the St. Louis manual training-school, gave a full account of that institution, which had been exceedingly useful thus far. Mr. Spencer Borden, owner of a bleachery at Fall River, Mass., encouraged the proposition; saying that he had become dependent upon foreigners for foremen of his factory, much against his wishes. The discussion showed much sympathy with the plan, though very little for labor-industrial schools, the latter tending to speculation upon the work of the pupils.

Professor W. O. Atwater of Wesleyan university read a paper on percentages and costs of nutrients in foods, which elicited great interest. Of the different nutrients, protein is physiologically the most important, as it is pecuniarily the most expensive. Among the animal foods, those which rank as delicacies are the costliest. The protein in oysters costs from two to three dollars, and in salmon nearly six dollars, per pound; in beef, mutton, and pork, it varies from 108 to 48 cents; in shad, blue-fish, haddock, and halibut, about the same; while in cod and mackerel, it ranges from 67 to as low as 33 cents per pound. Salt cod and salt mackerel are nearly always, fresh cod and mackerel often, and even the choicer fish as blue-fish and shad, when abundant, cheaper sources of protein than any but the inferior kinds of meat. With the larger proportions of both refuse and water, the proportions of nutrients, though variable, are usually much less than in meats. Thus a sample of flounder contained 67 per cent of refuse, 28 of water, and only 5 per cent of nutritive substance; while the salmon averaged 23, the salt cod 22, and the salt mackerel 36, per cent of nutrients. The nutrients in meats ranged from 30 per cent in beef to 46 in mutton and 87½ in very fat pork. Canned fish compare very favorably with meats. Vegetable foods have generally less water and more nutrients than animal foods. Ordinary flour, meal, etc., contain from 85 to 90 per cent or more of nutritive material; but the nutritive value is not proportional to the quantity of nutrients, because the vegetable foods consist mostly of carbo-hydrates, starch, sugar, cellulose, etc., of inferior nutritive effect, and because their protein is less digestible than that of animal foods. Potatoes contain a large amount of water and extremely little protein or fats.

Prof. J. W. Chickering, jun., and Prof. J. C. Gordon of the National deaf-mute college, Washington, read papers upon the condition of deaf-mutes and deaf-mute instruction. Deaf-mutes average 1 in 1,500 of the world's population. In the United States there were 33,878 reported by the last census. Over 15,000 have received an education, and are engaged in the

ordinary pursuits of life, 12,000 are of school age, and from 1,000 to 2,000 are uneducated adults. There are fifty-eight schools and one college, for this class, in this country. The usefulness of the educated and the pitiful condition of the uneducated were described by Professor Chickering. Professor Gordon maintained, in opposition to the views of Dr. A. Graham Bell, that the complete education of those born deaf demands social knowledge, special training, and special methods which are not possible in common schools; while the literal co-education of those born deaf, with hearing children, is an admitted impossibility. Deaf children prepared by special instruction to join regular classes in common schools without detriment to themselves, or to their classmates, do not need common-school instruction, having incidentally accomplished the work of the common school in gaining this mastery of language. The advantages of association with hearing children in the public schools are largely illusory, the environment being substantially the same as that of all deaf children before leaving their families to enter special institutions. Parents and public-school teachers can readily qualify themselves to render valuable help to deaf-mutes by beginning their education, and supplying, as far as possible, the training corresponding to the material education of infants and the earlier part of the work of kindergarten and infant schools. No satisfactory plan has ever been found for supplying deaf classes, in public schools, with teachers having the special fitness, knowledge, and training requisite for the satisfactory education of those born deaf. Special institutions remain a necessity for the great majority of deaf children; and they show superior results with the greatest economy of time, money, and men, irrespective of method, system, or devices of instruction.

Mr. William Kent of New York read a paper on irregularity in railroad-building as a chief cause of recent business depressions, which he supported with statistics and diagrams. He proved some remarkable coincidences during four periods from 1860 to 1883, 1869 to 1873 and 1879 to 1883 having been periods of great activity in railroad-building. The paper was discussed by Mr. Loren Blodget of Philadelphia, Mr. James H. Kellogg of Troy, N.Y., Mr. J. R. Dodge, and Mr. E. T. Peters. It was not generally conceded that cause and effect had been proven. Mr. Blodget referred to similar irregularities in English rates of interest, and Mr. Dodge to similar irregularities in cereals produced. In 1873 and 1874 these fell off six hundred millions of bushels, and the price rose from forty to sixty-four cents.

Mr. P. H. Dudley described his dynagraph and track-inspection car, and many members visited the car at West Philadelphia. This is one of the greatest of the many recent inventions for the safety of the travelling public.

Mr. L. A. Smith of Washington pointed out the advantages of great expositions to consist in 1°. stimulating the development of material resources, 2°. the introduction of profitable industries, 3°. the improvement of manufactures, 4°. the increase of trade, 5°. the founding of institutions, 6°. the social development of the people, 7°. advancement of science, and 8°. the promotion of technical education.

Don Arturo de Marcoartu of Madrid spoke upon the commercial relations of the United States with Spain and her colonies. He showed the meagreness of the present trade, and urged the importance of a treaty which should increase it. A line of steamers from Vigo or Lisbon to Boston or Baltimore is needed. The Umbria could make the voyage in six days. He desires to see the tariffs arranged so as to allow the exportation all over the Spanish territory of the American cereals, bread, coal, wood, cattle, and meats, and some other products wanted by the Spanish colonies; and to allow at the same time, on the other hand, the importation into the American union of wines, spirits, molasses, sugar, fruits, salt, and other Spanish products required in the United States.

Mr. George F. Kunz of Tiffany & Co. read a valuable paper on the American pearl, describing its form, color, lustre, and giving a list of the important 'finds.' He estimated the yield from 1881 to 1884 at $17,500 worth.

Dr. Charles Warren, statistician of the U. S. bureau of education, read a paper on the learned professions and the public, 1870–1880. Deriving the number of persons engaged in law, medicine, and divinity, from the occupation tables of the census, he showed that the rate of increase for each profession during the decade was much greater than the rate of increase in the general population. He commented upon the marked increase in the number of clergymen of foreign birth, and the great increase in lawyers, particularly in states situated north of the Potomac and Ohio rivers. Admitting that the number of clergymen is within the control of the sects purely, and not subject to legal interference, he observed that there is precedent for considering lawyers as officers of the state, and eminent propriety in making physicians also unpaid state officers. When this is done, the qualifications will be under state control, and indirectly the supply can be limited to actual needs. In 1880 he believes there was a surplus of sixty-four thousand in these three professions, and that decisive measures should be taken to remedy it.

Mr. Smiley of the U. S. fish-commission illustrated what is doing by the government in fish-culture, by presenting tables illustrative of the California salmon-work. An average of 2,500,000 young were deposited in the McCloud River from 1873 to 1883. The average annual catch has increased, since propagation began, by 4,391,882 pounds. This increase is worth, as it comes from the water, $313,700 annually. The annual cost of propagation is $3,600, leaving a net profit of $310,100 annually.

The sessions were all well attended; the number of persons in attendance frequently reaching fifty, and on a few occasions seventy-five. The popular character of the subjects induced this, and also induced the local press to give of this section much fuller reports than it gave of any other. The section has improved very materially since its organization at Montreal in 1882.