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IN THE DIFFERENT THEORIES which have been suggested to explain the constancy in the radiation from the sun, at least during considerable time-intervals, it has been generally supposed that the temperature of the sun has not varied essentially, and in order to explain this constant temperature it has been necessary to find some source for an accession to the sun's heat. For this purpose we have the chemical theory of burning, the meteorite theory of heat being produced by the falling into the sun of vast masses of meteors, and the theory of contraction. In all these theories it is assumed that the temperature of the sun must remain constant if the amount of warmth radiated from it is to remain the same, and that, if the temperature of the sun were to sink, the amount of energy radiated must decrease. Mr. John Aitken, in a recent number of the Proceedings of the Royal Society of Edinburgh, calls attention to the fact that these premises are not absolutely necessary, since the amount of radiated energy may increase even when the temperature decreases. The facts upon which he bases this possibility are the following: 1. It is known that the power of radiation varies with the form of the material, for instance, the flame of the Bunsen burner, although of a higher temperature, radiates less warmth than that of the ordinary gas-flame; 2. As a rule, the elements radiate less warmth than compounds, and observation has established that the amount of radiation increases with the complexity of the molecular structure; 3. It is well established that at high temperatures dissociation takes place, and compounds become less complex. We see, therefore, that in the sun, on account of its high temperature, substances must exist in less complex form than on the earth, to which conclusion many of the recent deductions of Lockyer specially point. It is therefore probable that the radiating power of the material of the sun is far less than that of the earth; also that the hotter the sun, the simpler its constitution, and just so much smaller its radiating power. It is, then, no longer necessary to assume that the temperature and the amount of radiated warmth from the sun are proportional. The temperature can decrease, and at the same time, on account of the change in the chemical constitution of the sun, the amount of radiation may increase. Sir William Thomson has recently calculated the numerical data, according to the Helmholtz theory of the sun's warmth, and has found that the sun would have to contract thirty-five metres yearly in order to produce the energy which it radiates according to Pouillet's measurements. In this connection it should be said that Langley's measurements give a far larger warmth-radiation from the sun, and that they are probably too small; so that the sun would have to contract much more than thirty-five metres a year in order to produce its radiating energy through the force of gravity. But evidently energy would be produced in the sun in other ways during the cooling-off. The falling temperature, for instance, would allow of compounds being produced, which act of burning, as it were, would add to the temperature. Mr. Aitken acknowledges that his suggestions are of the nature of speculations, but he has published them in order to bring out the possibilities that the radiating power of the sun may have changed, qualitatively and quantitatively, from time to time, that its amount does not necessarily vary directly with the temperature, and that it is very doubtful whether we may apply to the material of the sun the observations on radiation which we have obtained in the laboratory.

AMONG THE 'MOVEMENTS' agitating the country is one known as the 'Old South Work.' This is not, as might be supposed, a move to stop the growth of the 'New South,' of which we hear so much, but an attempt, and a vigorous one, which started with some public-spirited ladies of Boston, with Mrs. Mary Hemenway at the head, to interest and instruct the population now living within the borders of the United States in the history of the country, especially in so far as it has an influence on present conditions. Too much time has been spent in the schools in laying before the pupils the, at this epoch, unimportant details of the early Indian wars, with the result of leaving them uninformed of later events, the effects of which have a much more immediate influence on their lives. Many believe that the American mind is empty of American history, and fear that this may lead to ignorance of those principles which have given us the success which is now our portion. But why call this movement to educate Americans in what their fathers and their grandfathers did the 'Old South Work'? It is simply that because of this ignorance, which bred indifference, the people of Boston were willing a few years ago that the Old South Church, one of the theatres for some of the most stirring acts of the Revolution, should be wiped from the face of the earth. To save the building as a reminder of the revolutionary deeds of Boston, Mrs. Hemenway gave liberally of her time and money. This was one act in striving to interest Americans in America and her history; and for some years Mrs. Hemenway was nearly alone in sustaining the 'Old South Work.' Now we are glad to chronicle that the movement has grown, and has gone West. At Chicago Mr. Edwin D. Mead has instituted a series of lectures. In Madison, Wis., a similar course has proved so popular that hundreds have been turned away each evening for lack of room. Again, in Indianapolis this instruction of Americans in what Americans have done has been found to meet such approval as to lead to similar courses in the larger towns of Indiana. We hope, that, like most 'movements' which go from the East to the West, this may prove to have the necessary staying qualities, and that the rising generation may know how the political problems they have to solve have grown from what went before.

THE GOVERNMENT EXHIBIT AT CINCINNATI.

THE National Museum, the Smithsonian Institution, the United States Geological Survey, and the Bureau of Ethnology will make a joint exhibition at the Cincinnati Centennial. Although the time for preparation has been very short, the law making the necessary appropriation not having been approved until May 28, the government scientific exhibits will be in Cincinnati in good season, and will constitute one of the most interesting features of the exposition.

In determining what to show, those in charge have been greatly embarrassed by the abundance of material from which to choose. Cases of selected objects will be taken from several departments of the National Museum, but mainly from the departments of anthropology, zoölogy, and of arts and industries. Those selected from the department of anthropology will illustrate the plan upon

which the National Museum is being arranged, by means of a number of cases showing the geographical distribution and physical characteristics of the races of men, the processes and results of some of the most primitive arts, and also by a collection illustrating the subject of biblical archæology, and a collection of remains of prehistoric man in Europe, Asia, and America. The Bureau of Ethnology will also make a display in connection with this department, choosing for its topic the pueblo of Zuñi, its arts and industries, and also an exhibition of models of Indian mounds of the Mississippi valley.

In the department of arts and industries two subjects will be illustrated. The first will be the history of trade and commerce of the United States, in connection with which will be shown a series of models exhibiting the history of water-transportation in the Ohio valley, and another series showing the history of land-transportation for three centuries, especially in connection with the migration across the Alleghany Mountains. There will also be a series of models showing the different rigs of sea-going vessels.

The other subject to be illustrated in this department is the history of the graphic arts in America. This collection is in preparation under the direction of Mr. S. R. Koehler, who has recently set up in the National Museum a collection of a similar nature. The exhibit to be sent to Cincinnati will be an extension of this series. It will consist, first, of a series of selected specimens showing each method of engraving ever practised, one group illustrating wood-engraving, another etching, another copperplate, another mezzotint, and so on. There will also be shown, as fully as possible in the space assigned, a collection illustrating the history and present condition of the art of engraving and etching in America and by American artists. There will also be shown in considerable detail the history of engraving by mechanical processes, beginning with photo-lithography, and extending through all the modern processes of photo-engraving, autotype, photogravure, etc.

The foundation of this part of the exhibit will be the magnificent historical collection presented to the Smithsonian Institution by J. W. Osborne of Washington. Other series taken from the museum collections also form the nuclei of exhibits that have been greatly extended by loans from representative American engravers and etchers.

Another collection will show the history and applications of photography in America. This was begun four years ago by Mr. Smillie, the photographer of the National Museum, and will be exhibited for the first time in Cincinnati. A collection of engraved portraits of men connected with the history of American science, which has been accumulating in the Smithsonian Institution for twenty years, will also be sent to Cincinnati. Photographs of objects in the museum too valuable or too large to be removed, a complete set of photographs of the Grant and Washington relics, and a set of photographs showing each exhibition hall and laboratory in the National Museum and Smithsonian Institution, complete the list of exhibits by these two bureaus. Many objects sent to Cincinnati in 1884, and which are therefore familiar to those who will visit the exhibition this year, have been omitted from the present contributions.

The United States Fish Commission has been assigned three thousand feet of space in the exhibition-building. The centre forty-five feet of this space will be devoted to aquaria, representing a sloping, rocky hillside with plants and trees and a rustic fence. Over the rocks will fall a cascade into a pool below, six feet nine and one-half inches long, and three feet seven inches wide. From this pool the water will be conducted by a miniature McDonald fishway into a basin twelve feet long and six feet wide. The pools will be filled with fish, and water-plants will grow about the edges. The aquaria, thirty-eight in number, will be constructed in two rows in the rocks in the rear of the waterfall. They will contain specimens of all the *Salmonidæ* available, the brook-trout, the rainbow-trout, the Loch Leven trout, the lake-trout, and land-locked salmon, besides specimens of the principal species of food-fishes of the Ohio valley and Lake region, and carp and goldfish. These aquaria will be in charge of Mr. W. P. Seal, and the entire Fishery Commission exhibit will be managed by Capt. J. W. Collins.

In the remaining space will be shown the apparatus used in scientific investigation by the officers of the Fish Commission, — an outfit for deep-sea dredging and exploration, etc.; a collection of implements and pictures illustrating fish culture and distribution; a series of casts and other representative specimens of fishes, mollusks, and marine invertebrates that are sought for food, to illustrate the objects of the fisheries.

In a separate department the story of the fisheries will be told, mainly by an extensive collection of large photographs and crayon drawings illustrating the methods employed in the fisheries, the boats and apparatus used, and even the manner and condition of life of those engaged in the fisheries. Among other interesting objects to be shown will be four large maps illustrating the distribution of the principal food-fishes, and fish used for bait in the Atlantic from Cape Hatteras to Labrador; a statistical map showing the yield of the fisheries of the country; a map showing in a graphic manner the work done in shad-propagation on the Atlantic coast, and one showing the increase in the catch of shad from 1880 to 1888.

MANNERS AND MEALS.

IN a paper by Garrick Mallery, on manners and meals, published in the July *American Anthropologist*, the author makes no attempt to exhume ancient customs from the ruins of the past, nor to describe those found in the low strata of culture represented by savage and barbaric peoples, which also explain details of our own prehistoric past. The line of thought deals rather with the customs of our own daily life in civilization. Its object is to notice those which show instructive peculiarities, and to ascertain their cause or occasion and their origin, in which attempt antiquarian research and ethnic parallel must be invoked for aid, though approached in a manner rather the converse of the usual anthropologic discussions.

It is perhaps not too much to say that a dinner-party thoroughly good in *ménu*, cookery, service, æsthetic appliances of sheen and color, culinary chemistry, the conquest over nature shown in condiments from every clime, roses in winter, and in summer ice, and last, though by no means least, in the guests with educated palates, affords altogether the strongest every-day evidence of high civilization. Brutes feed. The best barbarian only eats. Only the cultured man can dine. Dinner is no longer a meal, but an institution. An eminent jurist pronounced that the whole result and aim of the institutions and laws of England was to get twelve men in a box. It would hardly be a parody to contend that the most obvious result of our modern æsthetic and industrial triumphs is to get twelve legs under a table. Few will now assert that asceticism is intellectual. It is now truly regarded as a reversion to the plane of savages; and this is made more clear by the fact, that, when asceticism as regards food prevailed, it was accompanied with filth, and even want of decency in clothing.

A large part of the important work of the civilized world is accomplished or regulated at social dinners. Theodore Hook was reproached for bringing so many dinner details into his novels, and he defended himself with the assertion that the dinner was the great theatre of London life. Our fellow-citizens, some decades ago, were foolish enough to procure the recall of Reverdy Johnson as minister to the Court of St. James on the ground that he was spending all his time at dinners, but it was at them that he was successfully prosecuting his work. In Washington, not only diplomatic but many legislative and official transactions are arranged at dinners. This is in contrast with savage and barbaric life. Feasts were then the means of bringing people together; but the deliberations were before or after, and even ordinary conversation was unknown at the feeds. This perhaps is more strictly true among peoples who did not use alcoholic intoxicants as beverages; for the ancient Persians had a rule to vote in council twice, once sober and once drunk, so as to observe the mooted question from two points of view.

Anciently (and still in the lower stages of culture) no regular hours for meals were observed. Savages eat when they can get food, and continue to eat so long as the food lasts. The history of civilization may be traced in the changing hours of refection. Confining the examination to Europe since the middle ages, the maxim in the reign of Francis I. of France was "to rise at 5, dine at 9,