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ficial stones of the Aztecs. I present this instance as at least a plausible case.

The Texcocan monarch is said to have climbed the 500 steps that led to the summit to worship an idol that stood there, and it is said that this idol, hewn from the living rock, was the image of a coyote, the emblem of Nezahualcoyotl, the King.

Since, however, human sacrifice is acknowledged to have been extensively practiced by these people, it strikes me that in no other locality could we more readily expect to find the material evidence of the existence of such a practice as on the summit of this wonderful hill, a point which overlooked the whole valley of Mexico, and which seems to have been almost wholly devoted to the service of the gods.

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THE PRESENT CONDITION OF THE YELLOWSTONE NATIONAL PARK.

BY E. D. COPE.

TIME has fully justified the enterprise of Dr. Hayden in urging upon Congress the project of the creation of the Yellowstone National Park; and the protection of this and other especially interesting parts of our country by the arm of the National Government has met with almost unanimous approval.

The function of the Yellowstone Park may be looked on as three-fold: first, as a place of permanent preservation of the geysers and hot springs and their deposits; second, as a place of protection of the game of the country; and third, as a place of recreation for tourists. The first of these uses has always been uppermost. The second has been more and more engaging the attention of Congress, and the *NATURALIST* published an editorial in its issue of July, 1884, pressing on public attention the necessity of making it a more complete preserve for game than it had previously been. This article was reprinted; and later, our contemporary, *Science*, took up the subject editorially. As a probable consequence of this agitation a bill was introduced into Congress, last winter, providing for a more complete supervision of the territory of the park. Ten men with a gamekeeper and the superintendent, constitute the present force. As this was manifestly insufficient to police a territory of such great extent, the new bill contemplated the addition of fifteen men to the num-

ber, thus increasing the police to twenty-five men. Their salaries were fixed by the new bill at \$1500 per annum. The sum now paid is \$900, from which the men are expected to feed themselves, an important consideration in so expensive a region. This bill was not passed.

Since the attention of Congress and of the press has been directed to the park, the protection of its beauties and curiosities has been more efficient. A number of persons have been fined for breaking the geyser deposits, including at least one member of Congress. In this respect the protection may be considered to be now fairly good. Protection of game has been less successful because more difficult, and because of the great inadequacy of the force. Bison, elk, moose, deer, etc., are far less abundant than when the park was first created. The bison have been, I am informed, reduced to a herd of about sixty individuals, and the elk have been decimated. The moose are confined to a small region. From the inaccessible nature of their habitat, mountain sheep have not been so reduced in numbers. Protection has, however, become more definite in this direction. During the past year several persons have been fined from \$75 to \$100, and one old hunter, who defied the guards, was caught, fined \$100, and imprisoned for six months.

These measures of protection can, however, only be carried into effect by an increase in the force and their proper distribution throughout the territory. Persons may now hunt undetected in the park, and may drive game outside of its boundaries without difficulty and kill it. The disposition to kill is not controlled by any considerations of decency in some men. Thus a party of English shooters killed, for their amusement, twenty or thirty from the bison herd without taking any part of the animals for their use, thus reducing their numbers by one-fourth at least, at one battue. Some persons state that protection is useless because the game leaves the park in winter. This I ascertained is not true, for there are numerous well-protected localities where the game winter safely.

The bill which was brought before Congress last winter for the more efficient protection of the park should be passed by the Congress of 1885-6, with some possible amendments. Thus the force should be increased to twenty-five men, each with a salary of \$1000 per annum exclusive of his food and boarding. The

park should be divided into twenty-five parts, each one supervised by one of the guards with perhaps an assistant or roustabout. A simple house for the guard should be erected in each one of the divisions, and the guard should reside there through both winter and summer, and not be permitted, as is now the case, to come into the settlements and remain there during the winter. It is well known that large game may be more readily destroyed in winter than in summer. Those guards whose districts include the geysers will naturally be more occupied with the protection of these objects than the protection of the game, as the one is generally abundant inversely to the other. Visitors should not be permitted to carry guns or other hunting apparatus through the park, and should be required to deposit them with some designated person to be held during their stay in it.

A project for reducing the size of the park has already been introduced into Congress. This is in order to permit the construction of a railroad to the Clark's Fork mining camp, through the park via the Yellowstone, the East Fork, and Soda Butte creek. As the law creating the park forbids the passage of railroads through it, it is sought to alienate a tract of land from the park, of a triangular shape, of about forty miles in length and twelve to fifteen miles wide at the widest part. An examination of the map will show that the direct route from the Clark's Fork mines to the Northern Pacific railroad is not more than *one-tenth* as long as the one proposed to pass through the park, so that it is difficult to guess at the motive which prompts the proposition in view. The project should be subjected to the most rigid examination, as any alienation of the territory of the park seems to be unnecessary. On the other hand much greater security as a game preserve would be accomplished if the region on the south-east border of the park, which includes the Hoodoo mountains, were annexed to it. It is the headquarters of the game of the country, and that of the park frequently resorts to it. It is excessively rugged, and is nearly useless to man for any other purpose.

As regards the entertainment of tourists, the administration of the new superintendent, Mr. Weare, has been a great improvement over that of his predecessor. The monopoly of transportation, sought to be established, has been abolished, and competition is free to guides and hotel-keepers. This naturally has the

effect of reducing rates, and will do so still more, for the charges have not yet reached bed-rock. When this desirable result has been achieved, the Yellowstone National Park will become one of the most popular resorts for tourists of all nations, who will be amply repaid by an inspection of one of the few remaining regions of the earth where thermal activity still reaches its surface, and of the grand and impressive scenery which surrounds it.

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AN OBSERVATION ON THE HYBRIDIZATION AND CROSS-BREEDING OF PLANTS.¹

BY E. LEWIS STURTEVANT, M.D.

GEORG von Martens, in his *Gartenbohnen*, Ravensburg, 1869, p. 35, under *Phaseolus Pardus virescens*, the graugrune pantherbohne, says: "I was very much surprised to obtain not less than eight varieties of beans, die incarnatbohne, die dottergelbebohne, die weissebohne, die amethystfarbige zebrabohne, die graugrune pantherbohne, die helle pantherbohne, die gelbfleckte pantherbohne, and the princessinbohne. With more thorough investigation I decided that the zebrabohne was most likely a neighbor which had overrun the bed, but all the others came from the bed, and some, the incarnatbohne and the weissebohne had not been planted in the whole garden." Martens might have expressed surprise that these varieties from the seed of the graugrune pantherbohne were all towards named varieties rather than sports or intermediates, but this fact, which frequently appears noted in his book, does not receive attention as being of any importance.

At the New York Agricultural Experiment Station, in 1882, a few oblong beans, slightly flattened sidewise and mottled in two shades of brown, were selected from the yield of the golden cranberry. This selection, planted by itself in 1883, gave eleven distinct forms, many of which can be referred to named varieties, and possibly with a greater acquaintance with varieties all might be so referred; an illustration confirmatory of the results above noted by Martens, and is strengthened by a list of similar occurrences with other varieties in 1883 numbering a score.

This fact of named varieties being produced from seed of other varieties is not confined to the bean family alone. The following

¹ Read before section F, A. A. A. S. at the Ann Arbor meeting.