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THE RETURN OF LIEUTENANT PEARY.

In the month of July, 1893, Lieutenant Peary set out on the second of his famous expeditions to the Arctic regions. On Saturday, September 21, the steam whaler Kite, which started on July 10 previous, with a relief party, steamed into the port of St. Johns, N. F., with the intrepid explorer on board. This was the second time that the Kite had performed this good service for the explorers. Lieutenant Peary's first journey was begun in June, 1891, and he was brought back by the Kite on September 11, 1892.

In the earlier expedition the Lieutenant had discovered and named Independence Bay, on the northeastern coast of Greenland. He proved by this discovery that Greenland was an island. His intention on his second expedition was to cross over the inland ice to Independence Bay, 650 miles distant, taking a route midway between his former outward and homeward tracks.

The bitter cold proved too much for the party; and after their return all of the members of the expedition except Peary, Lee, and Henson, Peary's servant, returned on the Falcon to America. In August, 1894. On March 22 of this year the intrepid party of three again started for Independence Bay: which point they reached with difficulty in June. Here he failed to find a food supply that had been left by the previous exploring party, and reluctantly his project of pushing on from this point to the far north had to be abandoned. The return trip was full of suffering and want. They had to shoot the forty-nine sleigh dogs, one by one, to maintain the strength of those that remained. They put themselves on reduced rations of one meal of pemmican a day. Too weak to drag the sledges, they threw away their instruments, rifles, and extra clothing. On July 25, "after having eaten every morsel of food, three starving men and one dog staggered into Anniversary Lodge after a journey of 650 miles, not having tasted a morsel of food for the thirty-six hours before arriving." It is considered by the scientific and geographical societies that the results of Lieutenant Peary's indomitable labors in these two expeditions are well worth the money and hardship that they have cost.

Although the second attempt at exploration added little to our store of geographical knowledge, it was rich in scientific results. The party that returned home in 1894 brought with them a large number of specimens that will add greatly to our knowledge in the fields of natural science.

THE NEW MAXIM GUN OF SOLID STEEL.

Mr. Maxim, whose versatile genius is just now displaying its power in the two widely different fields of aeronautics and heavy rifled ordnance, has lately produced a 5 7 inch 45 pounder gun that promises to revolutionize the art of gun manufacture. He proposes to manufacture guns from one solid integral forging, and thereby supersede the present expensive and tedious system of "building up." It is well known that the present "built-up" gun consists of an inner core or tube, which extends the full length of the gun, over which are shrunk successively a series of concentric "jackets" or outer tubes. This is done in order that the whole mass of metal in the thickness of the gun may be thrown into a state of tension, and may be ready to receive and resist instantaneously the bursting strain that is set up at the moment of firing. Were it not for this initial tension the bursting effect of the charge would all be thrown upon the layer of metal that was next the bore, which would be ruptured before the next outlying mass of metal could assist in resisting the strain. In the built-up gun, as a result of the initial tension, every particle of metal from the center to the circumference is firmly gripping the bore; and the shock of discharge is felt and resisted instantaneously by the whole mass of the gun.

In the built-up gun, the work of carefully boring out and shrinking on the jackets is tedious and costly. Mr. Maxim saves this large item of expense. In his system the forging is roughly turned and then annealed in a slow furnace. It is next carefully turned, smooth bored, and rifled. It is next mounted vertically in a special furnace and rotated slowly, and a current of coal gas is forced through the bore. The carbon in the gas combines with the steel of the bore, hardening it and improving the quality of the steel. "When the gun was red hot," says Mr. Maxim, "the coal gas was shut off and a very large stream of cold oil, under high pressure, was forced through the bore." This cooled the bore and the inside shrank to its finished dimensions. The outside body of the gun now gradually shrank upon the cooled interior portion, and was thus thrown into a state of high tension. It was found that the metal of the bore was compressed 0.02 of an inch.

In the firing tests a 45 pound projectile was fired with a muzzle velocity of 2,200 feet and a pressure of 15 tons to the square inch. In the later proof charges a pressure of 22½ tons to the inch was reached. The guns stood the test excellently. One of them was 0.002 of an inch smaller after firing than before, show-

ing that the enormous outside tension of the gun, assisted by the concussion of the discharge, actually compressed the bore to a smaller diameter. If such guns can be made without any undetected flaws in the metal, it is evident that heavy ordnance can henceforth be manufactured in half the time and at half the expense of the present built-up system.

THE OFFICIAL PHOTOGRAPHIC COMPANY OF THE COTTON STATES EXPOSITION.

We are the well wishers of the Cotton States Exposition; and, as such, we feel called upon publicly to express our surprise and regret that the management of this enterprise should have put a vexatious stumbling block in the way of publications such as the SCIENTIFIC AMERICAN, in the matter of illustrating the various buildings and exhibits of the Exposition.

It had been our intention to illustrate very fully the progress of the South as shown at Atlanta, and for this purpose we had sent our special artist to the grounds with instructions to illustrate freely the most interesting features of the Fair. We find, however, that our intention is confronted point blank with a cast iron agreement that must be made with a certain Official Photographic Company before a photograph or a sketch can be made in the grounds. It would seem from the wording of the blank "agreement" that the Department of Publicity and Promotion has leased the privileges of photography and illustration to what is styled an Official Photographic Company, "having certain exclusive photographic privileges on the grounds of said Exposition Company."

Before the illustrated press can make even so much as a sketch on the grounds, it has to make application to this photographic company, agreeing as follows: "That all pictures taken shall be submitted to the Official Photographic Company, which shall decide if it is the desire of said company to copyright such picture, which said company may do; that should we" (the press) "desire to purchase from said official company any" of our own "copyrighted photographs, we will preserve the same from any other use than that for which they are bought, to wit for illustrating said Exposition in the columns of said publication only; that after any negatives bought from said company have served the purpose of illustrating, all such negatives shall be destroyed; that we will not permit any such negatives to be used in any other publication whatsoever."

Now we had hoped that the blunder which the directors of the Chicago Exhibition made in this matter (and which they had the good sense later on to modify) would be avoided at Atlanta.

The lavish illustration of this exposition in papers with a circulation such as that of the SCIENTIFIC AMERICAN gives to an enterprise like this an amount of free advertising and indorsement that it could scarcely get in any other way, and surely the very least return that the directors could make would be to give the illustrated press every possible facility and assistance in their work of illustration. It seems to us that the mere promptings of courtesy would suggest such a course.

Instead of this, we are confronted with an impossible agreement, which we are supposed to enter into with a certain company, which has leased the photographic privileges for the sole purpose of coining every dollar possible out of the bargain.

The power of copyright, as mentioned in the agreement, is vexatious as it stands; but when it is supplemented with a provision that after illustration such negatives, pictures, et cetera, shall be destroyed, the matter verges on the ridiculous, and shows, at least, that the managers of the Atlanta Exposition are thoroughly ignorant of the working of an illustrated newspaper office. The provision that such illustrated paper "will not permit any such picture to be used in any other publication whatsoever" is equally ridiculous and impossible. There is not a day passes that we do not receive requests from all over the world for permission to reproduce our illustrations in other journals. It is certain that, for the mere pecuniary benefit of an Atlanta Exposition concessionaire, we are not prepared to place illustrations in our journal which will be closed against similar requests from our contemporaries in the future.

The revenue derived by the Exposition from this concession cannot be very large. Certainly it cannot be large enough to compensate for the serious curtailment that it will produce in the amount of space that will be devoted by the illustrated press to the interests of the Exposition.

Considered merely from the standpoint of finance, the policy is shortsighted, and defeats the very end at which it aims. At best the revenue derived from this concession can be but limited; whereas the free advertisement, both pictorial and written, by illustrated journals, such as our own, would interest the public and undoubtedly bring many thousands to the fair who otherwise, but for the suggestion, would stay away. It is evident that the revenue derived from such visitors would far exceed the paltry sum which this vexatious and ill-