

there is at least as much unanimity among artillery officers concerning some mooted points as obtains among the engineers. Such a detail would not be without precedent. The "Royal Commission" appointed in England 1850, "to inquire into the present state, condition, and sufficiency of the fortification existing for the defence of our United Kingdom," and to examine "into all works at present in progress for the improvement thereof," and the most effectual means of rendering the same complete," consisted of engineer, artillery, and navy officers, and a civilian. When, in 1862 after the first action in which the *Monitor* took part, this board was reconvened, to it were added another representative of the artillery, one of the engineers, and one of the Navy. The reports of this board are public documents, and display a great advance over the illiberal and exclusive exclusiveness practised in our own service. Could no exception be taken to the manner in which some of our latest works have been constructed, our criticism would have less force. But as the object of fortifications is to protect the guns which the artilleryman must serve, and on whom rests the responsibility of success or failure, it cannot be considered presumption in him to sound thoroughly every point on which success may depend. In many cases the intelligent artilleryists is compelled to enter a silent but sincere protest against error that might have been avoided had a proper appreciation of the capabilities of the *personnel* and *material* of artillery entered into the original consideration of the question. It is quite certain that an artillery officer, charged with defence of any one of many of our forts, apprehending an attack, would be compelled to resort to some extensive engineering before he would feel at all satisfied with the situation; and in some instances he would prefer to place his guns in other localities rather than risk his reputation on existing chances.

(To be continued.)

THE GREAT ICE PLAIN OF GREENLAND.

(From the *Galaxy* for October.)

Most people who have ever heard of Greenland know that ice is the chief production of that country, yet probably but few are aware of the immense extent of her resources in this respect, or of the excellent facilities she enjoys for shipping away the crop. For much interesting information on these and other points concerning that country, we are indebted to a paper from the pen of William Pengelly, F. R. S. published in the July number of the "Popular Science Review." This paper is based partly on the observations of Dr. Brown, who accompanied Mr. Whymper in the Greenland exploring expedition sent out by the Royal Society of Great Britain in 1867, and partly on the observations of earlier travellers.

Greenland, in the opinion of this writer, is a wedge shaped island, which Dr. Brown believes to be thickly covered with ice throughout the whole interior, while the only visible land upon it is a strip of varying width along the coast, separating the interior ice region from the sea. This is the only habitable portion of the country; and for a short time in summer it is free from snow, and supports a considerable variety of vegetation. Viewed from the sea, this outskirting land presents the appearance of a circlet of bare islands, which rise in some instances to a height of two thousand feet. This island like aspect of coast is due to the

existence of a series of deep inlets or arms of the sea which divide the mountainous rim of land into areas of unequal extent. Following landwards, these arms of the sea are found, as a rule to terminate abruptly against great walls of ice, which vary in height from one to three thousand feet, according to the depth of the valleys they occupy, and of which the inlets themselves appear to be only the continuations. The face of one of these ice walls, belonging to what is known as Humboldt's Glacier, has an estimated breadth of sixty miles. It is at these interior points, where the great ice stream flowing down the valley encounters the water which fills it below, that icebergs are formed. The immense mass of ice constituting the glacier slowly creeps forward into the water, sometimes to a distance of half a mile or more, when from the buoying action of the water its motion is stopped and from the same cause rather than from force of gravity the projecting portion is broken off and thus becomes an iceberg. Many of these icebergs find their way to sea and disappear beneath the sun of more southerly latitudes; while many others ground in the inlets and there either slowly break to pieces, or as is sometimes the case, accumulate to such a degree that they choke up and even obliterate the passage from end to end.

Once fairly on the ice in the interior, a dreary scene meets the view—one great ice field, unbroken in all directions, except in those in which the outskirting land is seen. The traveller, however, finds it traversed with crevasses, the bottom of which he can neither see nor reach with his sounding line. The surface of the field rises continuously but gently, the gradient diminishing toward the interior. In the winter it must be covered by a deep layer of snow, and the surface must be smooth as a glassy lake; but in summer this covering is converted into water, which in the form of streams, finds its way to the sea directly by flowing on the surface to the edge, or indirectly by falling into crevasses, and thence by subglacial routes. As is the case with glaciers generally, the surface of the ice is ridged and furrowed; and so far as observations have gone this increases towards the interior. Nowhere is there to be seen on it a trace of any living thing, or a patch of earth, a stone, or in short anything whatever to remind one of the outer world.

"There seems every probability that the country is covered with one continuous almost level field of ice, concealing or obliterating all indications of hill and valley, and without a single break for upward of twelve hundred miles from north to south, and four hundred from east to west. Its thickness is unknown; but when it is remembered that every square mile contains six hundred and forty acres, that the weight of an inch of rain is upward of one hundred tons per acre, and that even exclusive of the pressure the specific gravity of ice is about eight-ninths that of water, it will be seen that this unbroken ice-field of Greenland must have an area of upward of three hundred million acres, and a weight of more than twenty-seven thousand million tons for every inch of its thickness."

The rarity of icebergs on the eastern coast, and the fact that the surface of the ice-field is entirely free from stone or other traces of land, have led to the conclusion that there is no high land in the interior, but that the ice slopes continuously from east to west; and as its surface in the known interior is considerably below the level of the bordering land, it is also interfered by

Dr. Brown that the bare surface of the country, were the ice removed, would present the appearance of a huge shallow basin—a basin now filled with ice, which slowly flows off in the form of glaciers through the enormous lips in the zone of mountain land forming its rim.

The yearly precipitation of both snow and rain is estimated at about ten inches; the discharge of ice in the form of glaciers about two inches, a small quantity by evaporation from the surface of the field, but most in the streams of water which pour out both summer and winter from beneath the glaciers. Whether increase or waste is greatest no one has yet undertaken to decide.

Dr. Brown confirms the opinion of geologists generally, that the west coast of Greenland is slowly sinking beneath the sea, and he gives much valuable evidence in support of the view; he does not however agree with other geologists in the belief that other parts of the island are now rising, but thinks that while there is unmistakable evidence that at some former period an extensive upward movement has taken place, at the present time the whole country is slowly going down together, at the rate of some thing like five feet in the century.

FATE OF THE CREW OF THE GRIFFON.

The following letter to the *Toronto Telegraph* explains what has long been regarded as one of the mysterious disappearances of history, the fate of the crew of La Salle's vessel. There can be very little doubt that the writer has hit on the clue to their fate, though why it should be so long unknown is strange, as the country about the Grand River and the tribes inhabiting it were well known to the early French settlers. The whole subject is worthy of further research.

SIR.—Having seen in your columns recently an account of the discovery of a quantity of bones on the bank of the Grand River, I wish to be allowed room in your paper to explain how those bones came there, and also to state some other things of importance in connection with the same mounds.

The bones found there have been pronounced by several eminent medical men to consist partly of the bones of Indians and partly of the bones of whites, a fact which renders any ordinary supposition as to their origin more difficult while at the same time, it is one of the main features of this explanation.

After inquiring minutely, and collecting all the information available, it appears that there has been a settlement of white men there, and that those men were the crew of that ill-fated vessel, the *Griffon*, the first vessel built on Lake Erie.

The circumstances connected with it are as follows:—

During the early history of Canada, we have it recorded that a French knight, by the name of La Salle having been told by the Indians, that in the far west there was a mighty river that ran southward, organized a party to go west and explore it.

After sailing up Lake Ontario they went above the falls as far as the mouth of a small creek, now called Black Creek, and there built the *Griffon*, and sailed westward up Lake Erie, and passing from Lake Erie to Huron, he named the intervening water "St. Claire." He then went on as far as Lake Michigan, and sailed to the southern