

## THE KLONDIKE PLACERS.

WHEN the attention of the world was called to the new Canadian gold-fields during the past summer, few people had ever heard of the Yukon placers. Nevertheless, prospecting has been carried on for over fifteen years throughout the whole length of the river, both in the North-western Territory of Canada, and across the border in Alaska. The number of gold diggers at work tended to increase from year to year, but the severity of the climate, and the difficulty of getting supplies into the country checked its progress, especially before 1892, when the first steamers were placed on the river by a trading company. In 1896 the total production of gold amounted to little more than 100,000*l.* with about 2000 miners at work, and although some of this was produced on the Canadian side of the boundary, little attention was paid to it by the Geological Survey of the Dominion, and it was reported as if it were a part of the Alaska output.

On September 6, 1896, however, Mr. W. Ogilvie, the surveyor of the Yukon district, reported to the Canadian Government that rich discoveries of gold had been made on Bonanza Creek, a tributary of the Klondike, which flows into the Yukon some fifty miles south-east of Fort Cudahy, where he was stationed, and about the same distance from the U.S. boundary. Mr. Ogilvie continued to make reports during the winter, and from his book on the subject, lately published by the Dominion Government, most of the following information is obtained. The discovery was made by G. W. Cormack, who had been in the country since 1887, and a rush from Cudahy at once took place, 200 claims extending 20 miles along the creek being staked out within a fortnight of the time when the strike became known. Later on, when the neighbouring creeks El Dorado, Hunker, Dry Fork and West Fork were found to promise well, the other diggings on the Yukon were almost entirely deserted. Miners travelled with sleds over the snow from Circle City and other places still further off in United States territory, and by January 1897, 2000 men were encamped on and around the Klondike, with scanty supplies and little protection against the cold, although a temperature of 50° below zero Fahrenheit was not unusual. Many men bought a share in the claims even as early as this for thousands of dollars, and the few labourers who preferred to work for hire received one and a half dollars per hour, working as long as they liked.

Little gold was actually recovered in the winter, the "pay dirt" being dug out and piled up to wait until the spring, when the frost had gone and water was plentiful. Some extraordinary yields were announced, however, as the result of prospecting washings, 250 dollars in a pan (containing about a quarter of a cubic foot of gravel) being reported, but not generally believed. There is little doubt, however, that from one to ten dollars per pan was usually recovered in El Dorado and Bonanza creeks, although the diggers, as is their wont, were very reticent.

In spite of this reticence and the lack of communication with the outside world, news of important discoveries leaked out, and in the early spring the rush into the Yukon basin from British Columbia and California was unprecedented. By May over 2000 people had entered the country by one route or another, and were pushing on to the Klondike, where the town lots of Dawson City had been staked out, and building was in progress. At the beginning of July the population of Dawson City had risen to 5000, and more people kept coming in; but the supplies brought by them were far from being adequate, so that the scarcity of provisions continued almost unabated, and as the summer wore on became more and more pronounced, until it was evident that the 7000 people who will be shut up there in the ensuing winter must suffer serious privations, if not absolute starvation,

before the Yukon River becomes navigable again next spring.

Meanwhile, about July 15, the first miners from Klondike reached San Francisco, bringing with them about 400,000*l.* in gold, and the excitement, which had been growing on the Pacific sea-board, became intense, and spread over the whole of the United States and Canada, and even reached England. Thousands of people started for the Yukon without sufficient supplies, and regardless of the fact that it was already too late in the season. Fortunately the means of transport failed. The steamers on the Yukon were delayed, owing to the lowness of the water in the river; and the difficulty of transporting large quantities of stores over the passes leading from the sea-board to the interior prevented the southern route from being used by the majority of the immigrants, so that not one in ten of those who started late in the summer succeeded in reaching the Klondike, and starvation, if it comes, will not be largely due to the newspaper boom of July and August.

Turning from the history of the district to the description of the gold-fields themselves, it may be remarked at once that the placers, which have caused so much excitement, do not present any very unusual features. The gravels are in general about 20 feet thick, and, as usual, the parts immediately overlying the bed-rock are the richest. The pay dirt is, however, said to be frequently 5 or 6 feet thick, and about 30 feet wide, the whole width of the creek-beds varying from 100 feet to 600 feet or more. The gold is very coarse, and is therefore easy to save with crude washing appliances. It is of lower standard than most placer gold, containing only about 800 per 1000 of gold, whilst the average fineness of Californian gold is about 880, and of Australian about 950. No very large nuggets have been found yet, the largest recorded being worth about 2*l.* 10*s.*, and in this particular the placers resemble those of the Pacific coast generally, where large nuggets are very scarce.

Mr. Ogilvie considers that the auriferous gravels have been derived from the crystalline rocks lying to the south of the Klondike, between it and the Stewart River, which also contains gold, but no evidence has been brought forward as to their age. An interesting point in connection with the question of age is that the ground remains perennially frozen, only the surface being thawed in summer to the depth of two or three feet. It would appear therefore that, like the placers of Siberia, these deposits have remained undisturbed and unaltered ever since the Glacial period, and perhaps some such evidence of this will in course of time be discovered, as was afforded by the remains of mammoths and other animals in the Siberian frozen mud.

It is worthy of note that the comparative lowness of standard of the gold is, under the existing conditions, in favour of the view that the placer gold is derived from the erosion of auriferous quartz lodes formerly existing at a higher level, and has not been formed *in situ* by being deposited from solution. For, according to those who support the former view, placer gold becomes of higher standard than reef gold after it has found its way into the drifts, the base metals being gradually removed by the solvent action of running water, in which gold is not readily soluble. Since, however, the Klondike gold has been frozen up during a large part of the time since it was deposited in the gravel, it is obvious that it cannot have altered in composition so much as the gold in river sands further south, and might be expected to resemble the gold in the parent lodes, which is not usually more than 800 fine. The low standard of the gold is not so readily accounted for by the accretion theory of formation of placer gold. Some auriferous veins have already been discovered both in the creek valleys and on the mountains round them, although no direct evidence has yet been adduced to connect these

lodes with the sources of the placer gold. Moreover, many nuggets have been found adhering to quartz, so that the weight of evidence appears to be in favour of the view that the gold in these placers, at any rate, has been laid down there by mechanical rather than chemical processes.

The method of working the placers resembles that followed in the frozen placers in the Trans-Baikal in Eastern Siberia. Prospecting is done chiefly in the short summer when the snows are gone and water is plentiful, but the excavation of the gravel is best carried on in winter when nothing else can be done. The shafts are sunk to the pay dirt, and tunnels are then run through the gravel, following the rich material wherever it may be. To soften the ground a pile of wood is placed against the end of the drift and set on fire, the gravel, to the depth of about a foot, being brought down by pick and shovel after the fire has gone out. As M. Levat points out in speaking of the Siberian placers (*Eng. and Mng. Jour.*, June 12, 1897), the method is not an ideal one, but the circumstances are difficult. The frozen soil cannot be easily worked with the pick, as it does not break but simply mats together under a blow. For the same reason powder and dynamite have little effect; moreover, the drilling of the alluvium through which quartz boulders are scattered is a slow and costly work. The gravel is piled up to await the arrival of spring, when it is washed in the cradle or in short sluices, which are expensive owing to the high cost of timber.

The future of the country can hardly be foreseen as yet. It is certain that next year hundreds of miles of unworked creek beds will be vigorously prospected by the thousands who will enter and find that all the ground on the tributaries of the Klondike is already occupied. If, as seems likely, other fairly rich placers are found, many of the men will remain in the country, and with the development of the auriferous quartz lodes and the beds of lignite, some of which have already been discovered, the Yukon district of Canada will probably become one of the steady producers of gold like California or Colorado. The output this year will probably not greatly exceed 800,000*l.*, partly owing to the scarcity of water in the creeks this summer, which has interfered with the washing in the creeks. Nevertheless, the Canadian production of gold for 1897 will with this addition be raised to over 1,000,000*l.*, or considerably above that of 1863, which amounted to 860,000*l.*, and is still the highest on record. There is little doubt that this will be largely augmented in the next few years, and that the Yukon district will be the richest Canadian gold-field yet discovered. T. K. ROSE.

#### NOTES.

THE International Congress of Zoology is to meet in Cambridge on August 23, 1898, and a general committee has been formed to make arrangements for its reception. The President-elect (Sir William Flower) has summoned a meeting of the committee, to be held at the rooms of the Zoological Society, 3 Hanover Square, W., at 2.30 p.m. on Thursday, November 4; and special notices have been addressed to those who have expressed their willingness to act as members of the committee. Zoologists who have not been asked to join the committee are requested to communicate with the Local Secretaries (International Congress of Zoology), The Museums, Cambridge.

H. M. THE KING OF BELGIUM has conferred upon Prof. D. E. Hughes, F.R.S., the decoration of Officier de l'Ordre Leopold. This mark of appreciation is due to Prof. Hughes' work in connection with his printing telegraph instrument, which the Belgian Government have largely used during the last twenty-seven years. The Belgian Minister of Railways, Posts and

NO. 1461, VOL. 56]

Telegraphs has telegraphed to Prof. Hughes the congratulations of the telegraphic service upon the distinction conferred upon him.

At a meeting of the Royal College of Physicians of London last week, the Moxon medal was awarded to the President, Sir Samuel Wilks, Bart.; and the Weber-Parkes prize of 150 guineas and a silver medal to Dr. Arthur Ransome for the best essay on consumption and its treatment. A similar medal, called the second medal, was awarded to Dr. Peter Paterson, of Glasgow. The Baly medal was awarded to Prof. Schäfer, of University College. This medal is given every third year to the person who has distinguished himself the most in physiology during that interval.

THE Reale Accademia dei Lincei has recently elected the following associates and correspondents:—National associate, in the section of zoology and morphology, Prof. G. B. Grassi; correspondent, in the same section, Prof. G. Fano; foreign associates in mathematics, Profs. H. Weber and T. Reye; in mechanics, Prof. G. H. Darwin; in mathematical and physical geography, Prof. F. R. Helmert; in geology and palæontology, Prof. A. Gaudry; in physiology, Profs. H. Kronecker and O. Schmiedeberg.

WE print in another part of this number an abridgment of a report drawn up by a deputation appointed by the Manchester Technical Instruction Committee to visit technical schools, institutions, and museums in Germany and Austria last July and August. This is the second time Manchester has delegated some of its educational advisers to see what foreign countries have done and are doing to establish an efficient system of scientific and technical education. The recent visit showed the deputation that since 1891 there has been a considerable development throughout Germany of educational means and resources. The technical education movement in England during the past five or six years has not gone unnoticed in Germany, and the effect has been the extension and improvement of facilities for imparting instruction of a scientific and technical character, the evident determination of Germany being to maintain the lead in higher scientific education. It is satisfactory to know that the educational authorities of some of our cities are also alive to the importance of scientific instruction as an aid to the development of our commerce and industries. When a deputation from an industrial city like Manchester speaks of continental schools and methods in the glowing terms of the report abridged this week, and urges the extension of higher scientific instruction as the force which will enable us to keep our place among the nations, it is time to give thanks that the eyes of leaders of industry have been opened, so that the intimate connection between science and commerce can be clearly seen. The discussion which took place at the Manchester City Council upon the report of the deputation, fully bears out the views expressed by Dr. Armstrong in his recent articles in *NATURE* on the need of organising scientific opinion (vol. lv. pp. 409, 433). Moreover, it shows that a large number of manufacturers are well able to understand that the reason for the prominence of some of the continental Powers lies in the educational system. It is evident that the report has given Manchester people a clear view of the direction in which advance should be made, and doubtless they will profit by it. Other municipal authorities would do well to send their wise men into the Fatherland for the lessons to be learned if they wish to make industrial progress.

PROF. G. H. DARWIN has gone to the United States to give a course of ten lectures on "Tides" at the Lowell Institute.

A SEA-FISHERIES exhibition, arranged to illustrate the fishing industries and the application of science to agriculture, will be opened in the Museum of Zoology, University College, Liver-