periments suggest, at any rate in the case of nitrogen, that the α particle is captured by the nucleus. If no electron is expelled, the resulting nucleus should have a mass $14+4-1=17$, and a nuclear charge $7+2-1=8$—*i.e.*, it should be an isotope of oxygen. It thus appears that the nucleus may increase rather than diminish in mass as the result of collisions in which a proton is expelled.

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MACKENZIE PARK AS A FIELD FOR SURVEY, EXPLORATION, LITERATURE AND ART

MACKENZIE PARK and the surrounding district affords a splendid opportunity for university summer parties, students, professors and others desiring a field in which to carry on surveys and explorations, writing and art work, for practice, experiment or other purposes. Mackenzie Park is the name locally applied in the Norway of Canada to a strip of country approximately twenty miles north and south by seventy miles east and west lying near the southern edge of the bottom lands of Bella Coola River and the eastern shore of South Bentinck Arm. Mackenzie Park is at the head of one of the longest fiords midway of the coast of British Columbia. It was so named in honor of Sir Alexander Mackenzie, the first white man to cross America north of Mexico and, who, surfeited with scenery in his long trip from Montreal through the Canadian Rockies, wrote superlatively of the scenery of the area now known as Mackenzie Park.

A petition has been made that this area might be turned over for administration by the Dominion Parks as a great out-of-doors museum and sanctuary for the conservation of animal and plant life, beautiful scenery and pure water. Any surveys and explorations, literature and art treating of the park or vicinity would be conducive to this end.

As a field for physiography, topography and mapping the area is excellent, being unsurveyed British Columbia Crown lands extending from sea level to about 10,000 feet altitude. It consequently affords ample opportunity for either practice or practical work. An aeroplane photographic survey would be useful in developing the park.

From the geographic and geological standpoint, many parts of the park have never been seen by white men. The many glaciers and waterfalls should prove of interest. From one point on Mackenzie Highway eighteen glaciers may be seen. Southeast and partly within the park is a glacier which is said to be forty miles long. The great number of glaciers ensures that a variety of glacial problems may be presented. Two glaciers may be seen from the Bella Coola Post Office and another from a point one mile up the road. In the park are thousands of waterfalls, some of them large. One near the eastern edge of the park is said by reliable frontiersmen to make a clear leap of over 828 feet. If this be true, it is the fifth highest known fall in the world, second highest in the western hemisphere and the highest in Canada. Surely the opportunity to first measure this fall or to take good large photographs, motion pictures, sketches or paintings of it should appeal to many university students or men of leisure. Hot springs are found on South Bentinck Arm.

From a botanical standpoint the park and surrounding region are practically unknown. Great variety of plant life and plant problems may be expected in this area, which extends from the sea, salt marshes and lowlands to the mountain peaks on the one hand and which presents climatic conditions ranging from the rather moist sea coast climate to the semi-arid conditions of the region embracing the eastern end of the Bella Coola valley where irrigation is practiced. Throughout the region there are four species of giant trees, thousands of them being over six feet in diameter—red cedar, cottonwood, Douglas fir and aeroplane spruce. On the western edge of the park the vegetation is luxuriant and semi-tropical. On the east are Jack-pine barrens.

Zoologically the area is interesting. Grizzly bear tracks may certainly be found within twenty-four hours after arrival at Bella Coola, at least in August or September. A hunter living near Mackenzie Highway in 1924 left home in the morning, went on foot to a glacier in the park not far distant and was able before supper time to bring back a mountain goat. Fourteen eagles have been counted on a single stub at the edge of the park area. The sea is very deep off Bella Coola and in it is such life as sea fans and sand sharks. The several varieties of salmon taken in North Bentinck Arm for the two canneries within five miles of Bella Coola offer many zoological problems.

From the anthropological standpoint the Bella Coola Indians are of interest. They are of the Salish linguistic stock and North Pacific Coast culture. They live within two miles of Bella Coola and may be seen working for the canneries. About one fifth of the known petroglyphs of Canada lie within a day's motorboat run of Bella Coola. The material culture, social organization and folk-lore of the Bella Coola has been studied for the National Museum of Canada, but much remains to be done. In archeology, linguistics and physical anthropology, the field is almost untouched. The rituals and dramas may still be seen

on occasion by the sympathetic, but they can not be easily seen by the typical tourist.

Carrier and Chilcotin Indians, who both belong to the Athapascan linguistic stock, visit Bella Coola and camp at several places in the valley during the summer. Each group stays several weeks and some of them return a number of times in the season, producing a picturesque subject for observation and study. Much yet remains to be done on the ethnology, archeology, folk-lore, physical anthropology and linguistics of these people.

In 1895 a colony of about 200 people of Norwegian extraction settled in the Bella Coola valley. These fine, sturdy, hospitable Canadians still occasionally prepare Norwegian dishes, do Norwegian carving, painting and embroidery and a few still have examples of the old country costume and jewelry. Here is opportunity for the study of folk-lore, carving and painting.

To the literary man, the district presents many features of interest. There are two types of Indians, one a sea coast communal sedentary folk, the other horsemen of somewhat nomadic habits. There is all the charm of the Norwegian fishermen living on farms, and the loggers engaged in hand, horse and railroad logging. All the races meet in the salmon canneries with their cosmopolitan crews of Norwegians and Chinamen, Japs and Indians, to say nothing of the Scotch engineer, the French-Canadian and the "American." There is also the romance of the trappers and prospectors that has not yet been adequately told. The cowboy life that drifts down from the interior and may usually be seen in evidence at Bella Coola and the Indian horse-men and horse-women are perhaps less modernized than anywhere else in Canada.

All the subjects of such great interest to the student and literary man have an equal attraction for the artist, the movie operator and the artist-photographer. Within or adjacent to the park are strange and wonderful types of men, glaciers and waterfalls. Within the forests are vast green roofed "cathedrals," pillared with tree trunks, carpeted with moss and illuminated by sunlight strained through green leaves and lending a glamor to the scene that can not be simulated by the man-made stained glass.

This region is reached by a weekly steamer from Vancouver for Bella Coola at a cost of $20.20, one way, including meals and berth. The traveler usually leaves Vancouver Wednesday night and reaches Bella Coola sometime Sunday, and has a good opportunity to see intimately the natural resources, industries and life of the coast as the steamer stops at Indian villages, salmon canneries and logging camps, often for a considerable time. Wholesome meals may be had throughout the Bella Coola valley at fifty cents and bed at the same rate.

The western edge of the park and part of the northern edge can be viewed from motor or sail boats on North and South Bentinck Arms. The next section of the northern edge of the park is adjacent to the automobile road, locally known as Mackenzie Highway, which now extends up Bella Coola valley for forty-one miles. Beyond this is a good pack trail for horses. Along the land route mentioned are post offices at Bella Coola, Hagensborg and Atnarko. There is telegraph communication with the outside world from Bella Coola and Atnarko. One may live in delightful simplicity and comfort at various places along the Bella Coola valley road with telephone and weekly mail service and yet walk in the park area to some glaciers and many waterfalls and return home in time for supper.

Here one may live in comfort among a picturesque and primitive pioneering people with unequalled scenery of mountains, glaciers and virgin forests at his very door. The person who longs for a complete change and yet hesitates to break connection with his business may enjoy all the wilderness that his heart calls for and yet be within telegraphic communication with the world of affairs. As a location for the summer field work conducted by many of the universities, Mackenzie Park is unequalled, since here is presented opportunity for study of several lines of natural history. Contributions to such study will be to the benefit of the park proper and to the country in general.

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THE UNSATISFACTORY STATUS OF THE GLACIAL CONTROVERSY*

INTEREST is revived in the problems of the cause or causes of "glacial periods" by the conclusions expressed in the well-written "Text-book of Geology," by Professors Pirsson and Schuchert.[1]

There are no more controverted and widely discussed problems in geology and terrestrial physics than those connected with the cause or causes of the glaciations, which, during short intervals throughout geologic time and at widely separated latitudes, have left their traces in and upon the crust of the earth. From the earliest Proterozoic to the present time tillites and tills mark glacial action.

In this latest authoritative text we find the following unsatisfactory conclusion, which fully expresses the general consensus of opinion on the subject, both as to the separate and combined causes.

* See also, "Ancient climates," *Scientific Monthly*, May, 1925, pp. 459–479.

[1] 1924, 2nd Edition, Jno. Wiley & Sons, Inc.