Year.	Number of vessels.	Barrels of oil.	Pounds of whalebone.	Pounds of walrus ivory.
1877	19	17,530	153,800	74,000
1878	17	13,080	114,200	30,000
1879	21	18,800	200,500	32,900
1880	19	26,700	409,000	15,300
1881	23	24,740	387,000	15,400
1882	32	22,975	360,500	17,800
1883	38	10,155	159,400	23,100
1884	39	20,450	318,700	5,421
1885	40	24,844	451,068	6,564
1886	44	20,307	332,931	5,273

The foregoing table shows the extent of the Pacific-Arctic fishery from 1877 to 1886. The number of whales secured each year varies greatly. In 1880, 265 were caught; in 1885, 222; and in 1886, only 153. The 'whale' oil includes also oil of walrus.

A. HOWARD CLARK.

ICE AND ICEBERGS.

IN a paper read before the Royal society of Canada (May 27, 1886), 'On some points in reference to ice phenomena,' Dr. Robert Bell discusses various observations on the formation of ice and its action on the land. The rapid disappearance of icebergs after they have passed the banks of Newfoundland, he ascribes to the difference in temperature of the Gulf Stream and the interior of the berg, which is probably much colder than 0° C. He supposes that the rapid increase of the temperature of the water causes the ice to crack; and this process, once started, would rapidly continue as the colder parts of the interior come in contact with the water. An experiment made at Ottawa proved that ice, on coming in contact with warm water, really cracks. Though the difference in temperature may take an active part in fracturing icebergs, some other facts ought to be investigated before it is possible to decide on this question. The icebergs of the Labrador current show, even while in Baffin Bay, many signs of decay. The most remarkable ones are the deep grooves hollowed out by the waves breaking at the foot of the icy cliffs. The depth of these excavations and the amount of *débris* scattered around the berg prove the efficacy of the waves in breaking up the berg. However, the greater part of the year the bergs are embedded in pack-ice, and protected from the action of the swell. This continues as far as the Labrador coast. As soon as the berg reaches the southern end of the pack-ice, the breakers formed by the Atlantic swell will undermine its cliffs, the *débris* furthering their action. The history of icebergs may well be observed in Baffin Bay. The greater number are flat, and shaped like a table, having a flat top and vertical edges. They attain a size of from twenty-five to thirty square miles, and are about four hundred feet thick, their height above the water being fifty feet. These masses of ice, on striking a rock or a shoal, are broken up into small pieces, all of which have vertical edges. A very few of these are tilted, the horizontal top becoming inclined and partially submerged. Thus some parts of the berg attain a far greater height than they had before the tilting, and it is probably thus that the high and pointed icebergs originate. Flat bergs are very stable, while pointed ones show signs of frequent tilting and capsizing. Grooves which were excavated by the swell may be seen in all parts of the berg, some of them even running vertically. Sometimes many parallel grooves prove that large pieces of the unsubmerged part of the berg broke off, and that it gradually emerged from the ocean. Grooves diverging from one edge are of frequent occurrence, and were caused by the lifting of one side of the berg. It would be of great importance to know whether the tilting has any influence upon the direction of the cracks and fissures. These are always vertical while the bergs are in their original position. There are no observations which would enable us to decide whether the same direction is maintained after the tilting, which would be of eminent influence on the breaking-up of the iceberg. If, after the tilting has occurred, inclined faces would originate, this would materially contribute to a rapid destruction. As even small pieces of the large bergs have vertical edges, their direction is probably due to the structure of the ice, and will be maintained in any position the ice may have.

Bell remarks that the amount of rocky and earthy material carried from north to south by bergs is not very large. Field-ice, on the other hand, particularly such as is formed in shallow bays with high tides, and near the land, always carries great quantities of mud and stones, which are carried upon it by the wind or avalanches. We do not think that any amount of material is carried upon the ice by torrents formed by the melting of snow, as Bell supposes. The ice always contains some salt, and, as the melting-point of the fresh water coming from the land is higher than that of the ice, the latter is rapidly wasting at the mouths of the rivers.

In regard to the formation of Frazil (anchor) ice,

Bell is in favor of the hypothesis of Dr. Sterry Hunt, who regards it as due to terrestrial radiation, and analogous to the formation of hoar-frost on the surface of the ground in clear weather. A similar opinion was held by Arago, but this theory does not explain all the phenomena; and the views of Zschokke, that the anchor-ice is formed on the surface and carried to the bottom by the current, seem to agree better with the facts. C. W. Weber and J. Rae agree with this theory. It is doubtful whether water is so diathermal for dark rays that the radiation should have any effect on the formation of anchor-ice.

Of great interest are Bell's remarks and observations on the long fissures which remain open throughout the winter. He proves that the changes of temperature have no influence upon their width. They form every winter in the same situations, and generally between the extremities of points on opposite sides of the water. He considers it probable that the progressive lowering of the water going on during the winter produces a tension on such places sufficient to keep the fissures open.

Finally, Bell explains the remarkable rings and dikes of bowlders caused by the action of the ice. In ponds which freeze to the bottom, bowlders are incorporated in the ice. As the ice is evaporating at its surface, while accessions of water lift the ice, the bowlders are raised and gradually carried toward the periphery. On large lakes the drifting ice is pressed against the shores, and thus forms dikes of bowlders.

MÜLLER'S SCIENCE OF LANGUAGE.

THE appearance of the concluding part of Dr. Müller's great work on linguistic science, which has occupied ten years in its publication and of course a much longer time in its preparation, affords a good opportunity for considering this important contribution to science as a whole. In speaking of it as concluded, however, the term must be understood as applying to the original plan, which contemplated only three volumes. In this sense, the author regards his work as completed. But, as we learn from the preface to the latest portion, he purposes adding two supplementary volumes, one of which will be occupied with the analytic and the so-called 'mixed languages,' as well as with new idioms, extinct and living, of undetermined position, while the other will comprise the materials which have accumulated during the past ten years.

Like the other inductive sciences, — and perhaps even more than the majority of them, — comparative philology has been a rapidly growing science. No better evidence of this fact can be found than in the comparison, to which the author himself invites us, of his work with that of his noted predecessors, Professors Adelung and Vater, whose well-known 'Mithridates' presented the first general survey of languages ever attempted on a scientific plan. That great work, of which the last volume appeared in 1817, is justly deemed a monument of erudition and laborious research. The authors undertook to give an account of all known languages, with (wherever practicable) the Lord's Prayer as a specimen of each, translated and carefully analyzed. The work was as well accomplished as was possible at the time. But the necessary materials were to a large extent lacking, and the principles of the science were imperfectly understood. During the sixty years which have since elapsed, the progress of research has not only added largely to the data, but has developed many laws of the science, and in a great measure revolutionized its character. Exploring expeditions, missionary labors, and the study of ancient monuments have more than doubled the number of known idioms. At the same time, the profound investigations of many eminent scholars, in Europe and America, have elucidated the principles which lie, or seem to lie, at the foundation of the science. Some qualification is necessary in this statement, for in the science of language, as in other sciences, new discoveries are constantly appearing, which alter materially the aspect of what was deemed to be established truth. Not the less, however, is it certain that a vast progress has been made since the time of Adelung and Vater. Some able and practised hand was needed to gather up the immense mass of scattered material, and to frame a structure which should represent the present condition of the science, and make a solid platform on which other inquirers might safely build. No one, certainly, could be better fitted for this office, by experience and talent, than the distinguished scholar to whom we owe the linguistic portion of the history of the Novara expedition, and the well-known 'Algemeine Ethnographie,' which has long been a standard work.

In the brief preface to his first volume, Dr. Müller remarks that his work is designed specially for the use of academic lecturers and for students who desire the means of self-instruction. He has therefore purposely avoided the more popular and discursive method of books intended merely for general reading, and has adopted in preference the concise and systematic form of treatises devoted to the exact sciences. Throughout the greater portion of his work he has adhered strictly

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