thread. The State gives bounties to agricultural societies. The practice is extending of bringing all places of resort and amusement under the control of the State. In 1885 an act was passed, permitting municipalities to control skating-rinks, in order that the attendance might be regulated irrespective of sex and age. A recent law prohibits minors under the age of eighteen from working more than sixty hours a week in mercantile establishments. A weekly-payment law was passed in 1886.

Dr. Davis R. Dewey of the Massachusetts Institute of Technology finds that "the tendency of the statutes toward State interference is not so marked in Massachusetts as in Minnesota." From 1866 on, each year has seen an extension of legislation in the direction of control over employers.

Dr. E. W. Bemis of Springfield writes that "there has been a steady increase of State action during the past ten years in Massachusetts. This increase has been chiefly in matters of monopoly regulation, sanitation, education, and labor legislation. There has been no marked interference with the ordinary business or domestic life of the people, but the State has been called upon to control for the public good, large and otherwise irresponsible corporate bodies, and to protect the weak and ignorant." Dr. Bemis relates a case in which the New Haven and Northampton Railroad objected to the advice of the railroad commission to establish a depot in the town of Whately, Mass., through which the road ran. The commission thereupon ordered the depot built, and said, "The mistake of the railroad-managers in such cases is in supposing that the interests of the stockholders are paramount, and that the earning of dividends is the sole object to be sought in operating a road. Our supreme court has said more than once that a railroad-corporation is erected mainly for the public benefit, and only incidentally for its own profit. And because directors are liable to take a wrong view of their duties, the State reserves full control, and delegates to its agents the power of supervising the operation of these corporations." The State has a savings-bank commission with similar powers and duties. In 1885 a gas commission was organized, the function of which is, upon the complaint of the mayor of a city or the selectmen of a town in which a gas company is located, or of twenty customers of such a company, relative to the quality or price of the gas, to give a public hearing, and order such reduction in price or improvement in quality as seems best. And in Worcester this provision has been applied, and a reduction in price from two dollars and a quarter to a dollar and a half a thousand cubic feet was ordered by the commission. Thus, at one blow, the gas company's income was reduced by more than fifty-six thousand dollars per year. Dr. Bemis further states that more than four-fifths of the area, and probably two-thirds of the population, of the State, are under local prohibition.

Dr. Bemis sees no occasion for alarm in the progress of this tendency, because it has only passed into practice in "such cases as the condition of the times seems to demand."

[*To be continued.*]

THE EXPLORATION OF ARCTIC AMERICA.

THE map accompanying the present number of *Science* shows the present state of our knowledge of north-eastern Arctic America. During the last ten years very little has been added to our knowledge of this vast territory as compared to the period from 1845 to 1870. It was during that time that the search for Franklin resulted in the thorough exploration of the Arctic American Archipelago, in the discovery of the waters north of Smith Sound, and the discovery of the unknown parts of the coast of the continent. Though English expeditions did the greatest part of this work, we Americans may boast of names and discoveries not inferior to theirs: de Haven, Kane, Hayes, Hall, are names that will always be remembered in the history of arctic exploration. The names of American patrons of science, such as Grinnell's, are justly given to lands and seas discovered by the expeditions they had sent out.

After the period of lively activity in the Arctic regions, a relapse ensued, and the noteworthy expeditions since 1870 are very few. The German expedition to East Greenland explored part of north-eastern Greenland, and discovered the large fiords of that coast. It is only since last year that the important results of Holm's expedition in 1884–85, on the east coast of Greenland, are known. He discovered the ragged coast of Christian IX. Land. Danish explorers are continually adding to our knowledge of West Greenland. Nordenskiöld's remarkable journey into the interior of Greenland was made in 1883. However, it is in the Smith Sound region that the most important additions to our knowledge have been made. Every new expedition pushed the limit of the unknown area farther north. Bessels' tide-observations made on the 'Polaris' expedition first established the insularity of Greenland by showing that the Atlantic tide enters Robeson Channel from the north. The important explorations of the expeditions of Nares and Greely need hardly be mentioned. The explorations in the other parts of Arctic America are of no great importance. Hall's observations from 1864 to 1869, which were published only lately, gave corrections for several parts of the American coast; Schwatka's bold march to King William Land added a few details to that part of the map. A few scattered surveys by whalers, principally those of the enterprising Captain Spicer of New London in Fox Basin and Hudson Strait, are embodied in our map. Last we have to mention the German surveys on the east coast of Baffin Land.

How little is this as compared to the results of former years! And how much is still to be done! On looking at our map, it might seem as though the coasts and part of the interior were well known, but all maps are deceptive in this respect. In many instances we do not know the sources from which the information contained in the map was derived, and consequently are unable to test their accuracy; but wherever this was done, the maps proved to be utterly unreliable. A few weeks ago we mentioned the journey of Missionary Peck from Richmond Gulf on the west coast of Labrador, to Ungava Bay, by way of Seal Lake and Freshwater Lake. He reported that no such rivers and lakes exist as shown on our maps; yet we have to do the best we can, and reproduce what former maps contain, as it comes nearest to the real configuration of the land. Colonel Gilder informs us that the coast near Chesterfield Inlet is not at all similar to the map, but we have no means of correcting it. Is it necessary to point out a few other inaccuracies of the map? We do not know the configuration of Ungava Bay and the north-western half of Labrador; Wager River, on the west coast of Hudson Bay, and the north coast of Hudson Strait, are practically unknown; Eclipse Sound, on the west coast of Baffin Bay, is drawn from a rough sketch, without any actual survey, and so is Admiralty Inlet; and the vast territories in the interior of the islands and continent have not yet been visited by any scientific man. In short, there is not a square inch on this map on which important discoveries might not be made.

However, those are 'polar regions;' and it seems that, after the sad experiences of de Long's and Greely's expeditions, the mere word 'polar' is sufficient to suppress all interest in such explorations. The ideas conveyed by the word are of ships crushed by ice, and a party starving on an ice-field or devoured by ferocious polar bears. But this is a gross misconception of what polar exploration is and ought to be. Its object is the thorough exploration of the Arctic region and of all its phenomena. In order to attain this object, it is not necessary to organize adventurous expeditions the sole object of which is to push north and gain a few miles upon predecessors. The exploration of the polar regions is not a work for the bold and daring adventurer: it is the task of the careful scientist, who knows thoroughly what science will profit by every mile gained and by the study of all the phenomena of regions often passed by ships or never visited by man.

We will draw attention to some geographical problems which offer themselves in the vast area shown in our map, and which can be solved without incurring great expense or great danger. The problem which is of greatest importance is the exploration of the islands west of Smith Sound. There are two starting-points for such expeditions, — Hayes Sound and Jones Sound. Eskimo reports lead us to suppose that Hayes Sound forms a strait leading to the western ocean; but, even if this be not the case, Greely's expedition across the isthmus between Archer Fiord and Greely Fiord shows that it would not be difficult to reach the west coast. Jones Sound is easier of access. It has only been visited twice, — by Belcher and Inglefield on a short trip, — and no serious attempt has been made to explore its western continuation. From Eskimo

reports it would seem that it is closed, as indicated on our map; and seal and walrus are said to abound in its western part, which is formed by low land. If this information is correct, this would be an excellent starting-point for the exploration of the archipelago west of Ellesmere Land and the west coast of this large island. Such an expedition would not be very expensive, and almost without danger. The American expeditions of Schwatka and Hall show that sledging in the Arctic is the most successful and least dangerous way of making explorations. This district is of the greatest importance from a geographical point of view, forming the northern limit of the American continent. It will be very interesting to know the configuration of this district and its extent towards the north-west. The study of this region will show how far the heavy ice met with at the outskirts of the Arctic islands extends southeastward.

Another exploration which might be easily accomplished is that of Fox Basin and Hudson Strait. A ship stationed in these waters for two years might solve all important questions of that country. Ethnologists wish for an exploration of the central parts of the Arctic coast, particularly between King William Land and the Mackenzie, where the Eskimos may be studied uninfluenced by Europeans. These are tasks for American travellers. But where is the patron to-day who would encourage and support such enterprises? Who will be the next to carry north the little Henry Grinnell flag, which waved in so many parts of Arctic America? The means which are required to carry on such researches are so small that they will not hinder the resuming of the work as soon as it may be considered desirable.

Such work is not the adventurous 'polar expedition,' the only aim of which is to push north; but these explorations will enable us to go on step by step, and to reach the unknown regions of the Arctic Basin without running great risks. Explorations in Jones Sound will show how far we can go. East Greenland offers a safe basis for expeditions towards the north, and so does Franz Joseph Land. Hazardous expeditions into the open ocean without the shelter of land and without any line of retreat, such as de Long's expedition, must be abandoned, as they will almost always end in disaster. The exploration of the pole is not a work for a single adventurous expedition, however lucky and successful it may be, for the risk such travellers run is not adequate to the probable results. Progress must be made cautiously, and founded on the discoveries and experiences of past expeditions: therefore we believe that spasmodical efforts now in East Greenland, now in Smith Sound, now in Franz Joseph Land, are not desirable, but that one plan ought to be pursued by Arctic explorers. It is only thus that scientific results can be obtained.

The problems which must be solved in the Arctic regions are numerous and important. It is more than curiosity if we desire to know the outlines and the interior of the Arctic and Antarctic islands and continents; for without this knowledge geographical science is imperfect. We must know it, if we want to understand the circulation of the oceans and of the air; and researches in the Arctic are indispensable for the study of terrestrial magnetism. It is sufficient to mention these facts. Even commerce will profit by such expeditions. The produce of whale-fishery adds yearly considerably to our national wealth, and by new expeditions new hunting-grounds have always been opened. Many other resources of the Arctic Ocean are not yet made use of. There are enormous herds of walrus in regions easy of access, there are the lakes and rivers abounding in salmon, there is the valuable fur of the black fox and polar bear, and, though the commercial interest will always be of secondary importance in such enterprises, we must not overlook it.

Our map teaches that the problems of arctic exploration must not be looked for in the extreme north alone. The coasts of Arctic America and its numerous islands are a field for travellers which will yield important results for years to come. The explorer of these regions will contribute not less to science than the adventurous traveller who seeks to reach the pole, and his work will be surer of success, and accomplished with less danger and at smaller expense. We hope that researches in these regions will soon be taken up again, and that we may soon see American explorers again at work in this field.

DISTILLERY-MILK REPORT.[1]—IV.

Bibliography.

IN the replies received from our correspondents in answer to the circular letter, references are made to the following authorities, from which we make liberal quotations:—

Manual of Cattle-Feeding. By HENRY P. ARMSBY, Ph.D. New York, Wiley, 1887.

In the manufacture of distilled liquors, the first stages of the process are essentially the same as in the preparation of malt liquors, but after the fermentation the mash is subjected to distillation to separate the alcohol. The residue remaining in the still constitutes distillers' grains, or 'slump.' This has much the same composition as brewers' grains, except that it is more watery, containing only about eight or nine per cent of dry matter. Like brewers' grains, it has lost chiefly non-nitrogenous matters: it consequently has a narrow nutritive ratio, and is a valuable addition to fodder poor in proteine. Moreover, it contains a considerable proportion of mineral matters, which may be of advantage under some circumstances. Distillers' grains are best adapted for cattle, and yield excellent results in fattening or feeding for milk when rightly used. For sheep, hogs, and horses, they are not well suited. In using this feeding-stuff, its watery nature should not be forgotten. Its relatively large proportion of proteine renders it a suitable addition to a fodder deficient in this nutrient; while, on the other hand, the health of the animals requires the addition to the 'slump' of some dry, coarse fodder, like hay or straw. A poor quality of coarse fodder may be rendered more palatable to cattle by saturating it with distillers' grains, and thus the wateriness of the one fodder, and the poverty of the other as regards proteine, can be simultaneously corrected. Used in this way, distillers' grains constitute a perfectly healthy fodder. Much of the common prejudice against the use of distillery slops appears to be occasioned by their irrational application, and frequently by the filthy surroundings of the animals, rather than by any thing injurious in the feeding-stuff itself.

'Milk: its Adulterations, Analysis, etc.' By JOHN MORRIS, M.D. (*Maryland Medical Journal*, June 15, 1882.)

Of all the nutrients employed to rear children deprived of natural food (the mother's breast), I know no one more pernicious than the swill-milk sold in all large cities. Children fed with it appear to thrive and fatten, but their real vitality is much less than that found in those properly nourished. What seems to be fat is merely adipose tissue, just as is seen in chronic ale and beer drinkers, who are also deficient in vitality, and unable to withstand attacks of disease, endure privation or great suffering. During the summer months, cholera-infantum plays sad havoc among swill-fed children. Frequently after a few hours' illness they fall into a state of extreme prostration, collapse and death following rapidly. From the want of tissue-making food, they lack the vital force already alluded to, and all the efforts of the physician to arrest the disease and restore their impaired strength prove unavailing. The infant mortality in our large cities may be attributed in a great measure, I am convinced, to the employment of milk from cows improperly fed.

The draymen connected with the breweries of London are the most unhealthy body of men to be found anywhere. These men have the unlimited privilege of the brewery cellar. Though apparently models of health and strength, the slightest accident that befalls them generally proves fatal. Sir Astley Cooper mentions a case of a drayman, a powerful, flesh-colored, healthy-looking man, who received a slight injury from the splinter of a stave. The wound was trifling, but it suppurated. Sir Astley opened the abscess, but in going away forgot his lancet. On returning to get it, he found the man dying. Beer-drinkers, when attacked by any acute disease, are unable to bear the proper treatment necessary, and consequently die. They cannot undergo the slightest surgical operation with safety. Dr. Buchan says, "Malt liquors render the blood sizy and unfit for the circulation: hence proceeds obstruction and inflammation of the lungs. There are few great beer-drinkers who are not phthisical, brought on by the glutinous and indigestible nature of ale and porter."

[1] Continued from Vol. IX., p. 604.