

pensable as air. M. Ferdinand Duval, late Prefect of the Seine, in writing on the subject made the remark that water should not only be in sufficient quantity but in abundance, and a city in which the inhabitants have only a very limited supply of water at their disposal he compared to a ship in distress. It appears that the senate has just voted the bill for supplying Paris with drinking-water from the Vigne Springs in the Avre Valley. It will be four years, however before Paris feels the benefit of this decision, as the works cannot be completed before that period.

#### International Congress on Alcohol.

The International Congress on Alcohol will hold its sittings in Christiania, Norway, on Sept. 3, 4, and 5; and the programme, as given in *The Lancet*, gives promise of highly interesting and, we trust, fruitful discussions. The report of the president of the permanent committee (Dr. Forel, of Zürich) will review the work achieved in lessening the evils of drunkenness between 1887 and 1890, after which papers will be read as follows: "The Means which have Proved most Effective in Norway for the Diminution of Alcoholism;" "The Results of the Gothenburg System;" "The Alcoholic Question in Relation to the Rearing of the Young;" "The Degeneration of Indigenous Tribes through the Spirit Trade;" and "Freely Diluted Alcoholic Beverages, or, in other words, Moderation as a Means of Combatting Intemperance." Other papers on branches of the drink question will be read by Dr. B. W. Richardson, Professor Böhmert, Dr. H. Von Hebra, Dr. H. Kurella, and other distinguished promoters of the temperance cause. Many non-medical or lay friends of the same social reform will take part in the proceedings, the attractiveness of which will be materially enhanced by an exhibition of writings, illustrations, and various other objects bearing directly or remotely on alcoholism in all its ramifications. A similar exhibition was held at the last meeting of the Congress (at Zürich), and proved an excellent adjunct to the discussions.

#### LETTERS TO THE EDITOR.

\*.\* Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

The editor will be glad to publish any queries consonant with the character of the journal.

On request, twenty copies of the number containing his communication will be furnished free to any correspondent.

#### The Eskimo of Cape Prince of Wales, Hudson's Strait.

(THE substance of this letter was read at the last meeting of the American Association for the Advancement of Science.)

One of the chief troubles to contend with in making notes upon the customs of the Eskimo is their extreme sensitiveness to ridicule, and it is therefore most necessary that you should put on your gravest expression when questioning them. Sometimes this sensitiveness is very interesting to watch. Upon one occasion, when employing my favorite Eskimo, Ugaluk, as an assistant in my boat, and telling him to throw out the anchor, he immediately picked it up and carrying it to the bow was in the act of casting it overboard without a rope attached to it. We were just in time to stop him, and naturally laughed, rather immoderately, at which he sat down in the boat and covering his face with his hands remained in that position for a long time, and was too shy to speak to us.

If offended at any time with their own people, or either of my men, they would immediately leave, and, without saying a word, would go home, and for some time they were not to be seen. We sometimes regretted that they could not be offended oftener, for most of them required continual watching when anything movable was about.

One afternoon several men entered our house, and, standing near the fire, refused most positively to go out. Knowing that promptness of action has a good effect upon them, one of them was immediately handled rather roughly, and stumbling, fell as he was bundled out of the door, the others following suit. For a minute we thought there was going to be trouble; the next moment, however, they picked themselves up, and, all turning with smiling faces, said "*Chimo, chimo*," which means "We are

friends." I may add that orders to leave our house after this were never disobeyed.

While, as a rule, the Eskimo looks upon the white man as born to do him favors, those met with would sometimes offer payment for our services; and for the burial of an aged relative, who died when his friends were away hunting, one of my men received the valuable gift of about two gallons of blubber, which of course he accepted with many thanks. Nevertheless, if an Eskimo was given an unusually valuable present, he would immediately turn round and ask for the most impossible things, as though he thought you were now in a good humor, and now was the time to get all he could from you.

As far as could be seen, it seemed to be the general belief that all property, especially in the way of food, belonged to everybody in common, and therefore, if you held more than another, it was only because you or your family were physically strong enough to protect it. Few men, of course, would steal from one another when food was plentiful, thereby making enemies for themselves, but, when food is scarce, might is right, and all make note of the position of their neighbors' caches before the winter's snow covers them.

At one time, after a raid had been made upon my storehouse by some rather desperate Eskimo, my trusted friend Ugaluk informed me that his wife had gone to get a share of the plunder. At first we were inclined to harangue him for infidelity, but soon saw he had not the slightest idea it was wrong to receive stolen property. Upon another occasion, under similar circumstances, I induced Ugaluk to help me track the robbers, and, with some trouble, we traced them to a deep gorge, where all we could see was a large hole in the snow. This was the doorway of an igloo ten feet below the surface, which had been covered by continuous drifting of the snow. Into this hole Ugaluk dived, while I remained outside. He soon returned and asked me to follow, which I did upon my knees for some distance, until I found myself in a very dirty dimly-lighted room. Sitting near the lamp was a woman, and by her were three children, these being the only occupants of the place. The woman denied most emphatically any knowledge of the theft, and was not moved in the least when informed that her husband would stand a chance of being shot if he took part in another burglary. Feeling that perhaps after all we were mistaken, we were just leaving, when the woman called us back, and, holding up a small piece of salt beef, said this was all her husband had taken, as unconcernedly as though she had never denied it, and as though he had found it outside our door instead of having done a great deal of damage in securing it.

The Eskimo, of all races, are the most free, and in no case do they consider a man their superior unless he or his family are physically stronger or are better hunters than others. These superior men are treated with little deference, though they are usually sought for in the settlement of disputes, and sometimes act as public executioners. Ugaluk, who had all these qualities, was usually obeyed when an order was given by him, and we were much interested with his story of a comparatively recent execution which he undertook for the good of the community. Walking up to the offender, he held him in conversation for a few minutes, when suddenly, drawing a knife from his sleeve, he plunged it into his breast, and then finished him upon the ground, afterwards carrying his body out upon his kyak and dropping it into the sea. As Ugaluk related his story, in a whisper, he trembled violently, and it was quite evident he was haunted with certain fears.

As in civilized communities, there were several restless individuals living among those we met, who at different times had dwelt in many parts of the coast, one of whom at least had lived far up Fox Channel. These individuals are employed as traders, and evidently are the means of keeping the language intact.

As is well known, work is pretty well divided among these people, the men doing all the hunting and making and repairing implements, while the women take part in everything else, even in the making of boats and building houses, though the more laborious part of this work is performed by the men. When moving to a distant part of the coast, a small pack is put upon each dog, and the men and women divide equally the heavy goods to

be carried. When the snow is soft, the dogs are shod with seal-skin shoes.

The Eskimo's powers of endurance are wonderful. During the winter of 1885-86 many of those about me were reduced to mere skeletons through starvation, and, although they were helped as much as possible, several, it is to be feared, died not far from us. Some had eaten the skin covering of their bed, and were only saved by an occasional seal being killed and by the few lemmings they could catch under the snow. In one instance a case of what appeared to be economic hibernating was noted. Some distance from the Observatory a woman and her son were found closely huddled together in a house completely closed and not much larger than themselves. They said they had not had any food for some time, but expected friends in a few days. Leaving what food we had, we returned to the station, and extremely bad weather coming on some days afterwards, we had almost forgotten these people. Two weeks later we were reminded of them by an Eskimo having passed that way who said he had not seen them. Fearing they were dead, we went over with provisions, and much to our surprise found them, though little more than parcels of bones, perfectly well, and they declared they had lain there ever since. These people, with others, were soon stout and hearty when food became more plentiful.

In many of the narrow gravelly passes in the rocky hills, low walls were often noticed that had undoubtedly been built many years ago. These were in a straight line from one hill to another, and were usually nothing more than single stones about a foot high placed close to each other. Many conjectures as to their use were made, and, taking Ugaluk to one of these walls one day, he informed me that many years ago, when large numbers of Eskimo lived here, and wood was extremely scarce, some would bind sharp stones to their feet, and lying upon their backs behind these walls, others would drive the deer, which were then very numerous, and as the deer passed over the walls the hidden hunters would strike with their stone-tipped feet and would often kill many of them in this way. Regarding the scarcity of wood, it may be added that even now many Eskimo have not harpoons because they cannot procure a piece of wood large enough for a handle.

Having often heard of the dislike the Eskimo is believed to have to a white man exploring the graves of their dead, we determined to test this, and purposely went with several Eskimo, passing near where a number were buried. Here I stopped at one grave which had evidently long ago been visited by wolves or dogs, for the covering of stones had been dragged away and the bones were scattered in every direction. To my surprise the Eskimo looked on quite unconcernedly as I turned the skull and bones over with my stick, and, if anything, they seemed rather amused than otherwise. Suddenly I feigned an expression of fear, and while they looked at me made a bound forward, screaming as I fled. In a moment they were after me, screaming apparently in greatest terror. Soon stopping, however, I burst into laughter, and was immediately followed by all excepting the children, who evidently could not see the joke, nor would they return to the grave. During the remainder of my stay here we often examined other graves, but from a warm attachment for the dead, as well as for the living, not a bone was ever removed.

F. F. PAYNE.

Meteorological Office, Toronto, Ont.

#### Movement of the Higher Atmosphere.

If this question had been discussed previous to August 27, 1883, there would have been but one view expressed, and that would have been unanimous; namely, that the higher atmospheric layers have very little velocity, and if there is any motion it must necessarily be from the west toward the east. As it is universally admitted, even now, that the upper atmosphere has such a motion everywhere except in the equatorial regions, we need to give here some of the proofs that this law holds good for the latter region also.

1. A careful and elaborate theoretical discussion has shown the universality of the law. The merest outline of this discussion is as follows. The sun heats up the equatorial region more than the

circles of latitude on either side, and this causes a bulging, so to speak, of the atmosphere over this region. These air particles will have a tendency to flow off toward the north and south; but a particle going from the equator continually reaches a region that is revolving less rapidly, so that its course will be deflected toward the east. This discussion loses a good deal of its force, however, when we consider how exceedingly tenuous the atmosphere must be at a height of twenty miles. The barometric pressure would be less than one inch, and any motion of air particles in such a space due to their gravity must be exceedingly slow, if they move at all. If we should inquire as to the probable amount of heaping up in the air from the increased heat at the equator, we would see that it must be exceedingly slight. Above the height of seven or eight miles the changes in the temperature would be nothing, as the sun's influence is entirely dissipated there; moreover, the difference in temperature between the equator and a point at 30° north latitude would be so slight that this heaping up would be highly problematical.

2. We find these theoretical computations and views amply borne out by a study of the motion and velocity of the highest clouds. For days at a time no motion at all can be perceived in these clouds at the equator, and whenever it is noted it is always toward the east and very slow. Mr. Abercromby seems to have observed a motion of clouds toward the west, but this must have been seen in clouds at a lower level, which would move westward in the lower trade-wind. The evidence regarding the motion of these highest cirrus clouds comes by special correspondence with physicists at Batavia, Mauritius, the West Indies, and the Philippines, and is conclusive as regards this question.

3. In many cases volcanoes have projected ashes to enormous heights in the atmosphere, both in the West Indies and in Java. Some of these ashes have been carried a comparatively short distance toward the west by the lower trade current, but others have also been borne many hundreds of miles farther eastward by the upper current. A good example of this is given in an eruption of Krakatoa in May, 1883, in which ashes were carried twelve hundred miles to the eastward.

4. One of the best proofs that can possibly be had of the direction and velocity of the higher atmospheric strata would be seen in the cloud left by a meteor in its passage through the sky. In a recent meteor that fell in Iowa, in a perfectly clear sky, there was a most excellent opportunity of studying this question. This meteor left a beautiful whitish cloud, which was carefully watched by at least two observers. One of them saw it perfectly stationary, a little to the east of the zenith, for more than an hour. The other saw it over two hours, and it appeared to gradually diffuse itself in the atmosphere. It is easy to see that any appreciable motion would have made itself plainly manifest in the long time during which this cloud was visible.

We see that both theory and observation give no uncertain sound on this question, and up to Aug. 27, 1883, this may have been regarded one of the best ascertained and established facts of meteorology. On this date there occurred one of the fiercest volcanic outbursts ever known, at Krakatoa in Java. On Aug. 28 and succeeding dates there were seen most beautiful sky colorings at various points on the equator to the westward of Krakatoa, each appearance being at a later date the farther west one went. An enthusiastic astronomer at once suggested that a current of eighty miles per hour had borne the ashes of Krakatoa westward, and that the sky-glowings were caused by diffraction and reflection from these mechanically distributed ashes. This seems to have been an unfortunate invasion of an unknown field, and must result in disaster. Every effort has been put forth by astronomer and physicist to force such a current, but with two or three exceptions no meteorologist has accepted this view. We have already seen how untenable it must be. There are other insuperable objections to this hypothesis, but these against the velocity and direction of the current are the most serious.

The Krakatoaists have hailed with delight a certain theoretical computation advanced quite recently by Professor Ferrel, and it will be well to pass upon it at some length. Professor Ferrel first shows conclusively that the tendency of the upper layers must be toward the east, and then, referring to the sky-glowings, he tries to