

had conical summits, and from their general character, Mr. Thornton considered them to be volcanic. These mountains are supposed to be the southern extremity of the range extending from Abyssinia, and that the water courses descending their western flanks from the sources of the Nile. Colonel Sykes eulogised the enterprising conduct of Lord van Deccan, a Dutch nobleman, who, at his own cost, had undertaken several expeditions for the exploration of Africa, and to whose spirited enterprise and liberality the world is indebted for having had set at rest the question of the existence of snow-capped mountains in Africa within a short distance of the equator. Two communications recently received by the Colonial office were then read by Mr. Galton, giving accounts of the ascent of the Ogun, in Western Africa, by Captains Burton and Bedingfield, and of an expedition up the river Volta, on the same coast, by Captain Dolben. The country on the banks of the Volta was described as being luxuriant in vegetation, and well adapted for the cultivation of cotton. Captain Hartwright gave an interesting description of a tribe of negroes who inhabit the district of Lagos. They are, he said, remarkably intelligent, and exhibit great aptitude for trade, being on that account called black Jews. They have shops and warehouses, and some of them have their correspondents in England who supply them with goods. The peculiar intelligence of this tribe is observable even when in a state of slavery; and in the Brazils there is a thriving community of them who, having purchased their freedom, occupy an important position among the people, for it is the practice in the Spanish and Portuguese colonies to admit free blacks to all the privileges enjoyed by other citizens. On being questioned as to the probability of obtaining a supply of cotton from the western coast of Africa, Captain Hartwright said that the country was well adapted for the growth of cotton, but until the wars among the tribes, which had been incited by slave-hunting, ceased, there would be no cotton cultivated, and he recommended an armed interference by this country to put an end to the wars among the natives.

THE LAWS OF COOLING.

A warm body, says the *Builder*, loses its heat by radiation from its surface, and by contact with cold surrounding substances. The laws of cooling have been long known, and are expressed in the formulæ of Newton and of Dulong and Petit. From their experiments, confirmed by subsequent researches of others, we learn that the heat lost by radiation varies with the nature of the exposed surface. Polished metal emits caloric much more slowly than wood or any rough material. We learn also that the heat lost by contact varies with the form and extent of the surface of the warm body, and with the excess of its temperature over that of the surrounding medium. A cube cools more rapidly than a globe of the same material, and of equal weight, because the surface of the former is larger in proportion to the mass than the surface of the latter.

Red-hot iron becomes cold almost instantaneously when plunged into water; whereas, if left in the open air, it might retain its heat for hours, or even days. When we know the temperature of the surrounding medium, the form of the body, its weight, and calorific capacity, we can easily determine its rate of cooling and its temperature at every instant. In practice, it is seldom, if ever, necessary to take into account the conducting power of the body itself. Bad conductors, when placed in a medium colder than themselves, may be warmer at the centre than on the outside; but this difference of temperature is slight and unimportant. Gold has nearly ten times the conducting power of lead, and nearly three times the conducting power of iron and platinum; but all these metals are subject to the same laws of cooling. The difference in the rate of cooling upon the outside and in the interior of a mass of gold, and of a similar mass of wood or iron, is a matter of no practical moment. The conducting power of a body cannot be measured except in those cases where its heat passes out of itself into surrounding substances.

An inclosed space like a room, office, or house, is subject to the same laws of cooling as a warm body of similar form, or equal bulk, and of equal calorific capacity. A room filled with warm air, and without any openings for currents, would lose its heat slowly through the walls, roof, and floor; so slowly, indeed, that a perfectly air-tight building filled with warm air would retain its high temperature inside for many months, even if carried in the depth of winter to Iceland or any other part of the frigid zone. The cold of winter pierces very slowly through our walls and roofs. It rises still more slowly from the ground. The most of our building stones conduct heat as rapidly as cast iron. The addition of layers of other materials outside and inside, such as mortar, wood, paper, &c., diminishes this conducting power, and reduces it in most cases so far that it may be disregarded. Snow, also, is well known to be a medium peculiarly impervious to cold; a roof covered with a coat of snow, at 32 deg. is warmer inside than when it is exposed bare to the atmosphere at 32 deg. A very thin layer of mould protects vegetables from the frosts of winter, provided only the covering be impervious to the air. So, also, contrary to the ancient practice of raising thick partitions for securing warmth as well as safety, we find that the heat of the interior of a building is affected only in the slightest degree by the nature or thickness of the material which forms its exterior. In regard to our dwellings, where fresh, and, consequently, in winter, cold air is necessary to our existence, the whole subject of their warmth and healthfulness is reduced in practice to the regulation of the currents out and in, or their ventilation. In regard to icehouses and similar places for keeping in and shutting out the cold, the main point in practice is to prevent altogether the entrance and exit of air.

These simple general principles, well known, yet most important at this season of the year, deserve specially the attention of those engaged in the manufacture and preservation of ice.