condensers. The ammonia, in passing through the condenser, yields to the water the heat which it has acquired in doing refrigerating duty by its evaporation, and the heat it has acquired during compression (superheating being prevented by a liberal supply of oil), in the plant under discussion. The mechanical work done during compression being converted into its equivalent of heat, this amount of heat is also equal to the latent heat of volatilization of the ammonia, at the temperature of the condenser. The efficiency of the condenser determines in a great measure the economical working of the machine, and for this reason it is good policy to have as much condenser surface as practical considerations will permit, it is said for average conditions (incoming water 65°, outgoing 85°), it will take about 20 square feet of surface per ton of refrigeration, or, in other words, for 50 tons it will take 1,600 running feet of 2-inch pipe.

Where cooling water is very scarce, and especially where atmospherical conditions, dryness of air, etc., are favorable, the cooling water may be used again by subjecting the spent water to an artificial cooling process, by running it over large surfaces exposed to the air in a fine spray.

A device of this kind is described as being a chimney-like structure, built of boards, having a height of 25 feet, the other dimensions being 8 x 8 feet. Inside this structure are placed a number of partitions of thin boards, spaced four inches apart, extending to within one foot of the bottom of the structure. But the lower halves of these partitions are placed at right angles to those in the upper portion, this arrangement giving better results than unbroken partitions. The water to be cooled enters the structure at the top, where, by the use of galvanized iron overflow gutter, it is spread evenly over the partitions and walls, and flows downward in thin sheets. At the base of the structure air is introduced in such quantities that the upward current has a velocity of about 20 feet per second. The air meeting the downward flow of water, absorbs the heat by contact, and also by vaporizing about two per cent. of the water, reducing its temperature during the passage 20° F. The chief expense to be considered in the process of re-cooling condenser water is the lifting of the water to the top of the structure.

The oil used for lubricating the compressor differs from ordinary lubricating oil in that it must not congeal at low temperature, and must be free from vegetable or animal oils. For this reason, only mineral oils can be used, and of these only such as will stand a low temperature without freezing, such as the best paraffine oils.

FAILURE to receive THE CANADIAN ENGINEER on the part of our subscribers is always the occasion of much regret to the publishers, as we are aware that much of the value of a publication depends upon the regularity of its receipt. An occasional or intermittent visitor is little thought of either by the subscribers or the proprietors. We would be glad if any subscriber who does not receive his paper before the fifteenth of each month, would kindly notify us of the fact and enquiry will at once be made as to the cause of the delay.

WE have lately received a number of orders for complete sets of THE CANADIAN ENGINEER from our initial number, for reference purposes in public and private libraries, amongst others, the Smithsonian Institute, for example. We find it quite impossible to comply with these requests because we have not a single copy of our issue of May, 1893. Subscribers who have copies which they do not wish to preserve would greatly oblige the publishers by forwarding them to the Toronto office. We will pay one dollar, or two years' subscription, per copy of May, 1893, for a limited number.

ASBESTOS.

The use of asbestos in manufacturing is increasing, and new uses are being almost daily found for it—uses for which a satisfactory substitute might be hard to find. The following abstract from an article on this subject which we find in an exchange may prove interesting, if read in connection with the description of the Danville Asbestos and Slate Co.'s works, which appeared in the July number of THE CANADIAN ENGINEER:—

"In itself, asbestos is a physical paradox, a mineralogical vegetable, both fibrous and crystalline, elastic yet brittle, a floating stone, but as capable of being carded, spun and woven as flax, cotton or silk. It is apparently a connecting link between the vegetable and the mineral kingdom, possessing some of the characteristics of both. In appearance it is light, buoyant and feathery as thistledown, yet, in its crude state, it is dense and heavy as the solid rock in which it is found. Apparently as perishable as grass, it is yet older than any order of animal or vegetable life on earth. The dissolving influences of time seem to have no effect upon it. The action of unnumbered centuries, by which the hardest rocks known to geologists are worn away, has left no perceptible imprint on the asbestos found imbedded in them. While much of its bulk is of the roughest and most gritty materials known, it is really as smooth to the touch as soap or oil. Seemingly as combustible as tow, the fiercest heat cannot consume it, and no known combination of acids will destructively affect the appearance and strength of its fibre, even after days of exposure to its action. It is, in fact, practically indestructible. Its incombustible nature renders it a complete protection from flames; but beyond this most valuable quality, its industrial value is greatly augmented by its non-conduction of heat and electricity, as well as by its important property of practical insolubility in acids.

"As a matter of fact, Canada contains the great asbestos region of the world, in the sense that while its mines are practically unlimited in productive capacity, the product is of a quality which fully meets the requirements of the newest and most exacting of the innumerable uses that are daily being found for it.

"One of the largest branches of asbestos manufacture is that of sectional cylinders for pipe coverings for retaining the heat of steam and other pipes, felt protective coverings for boilers, frost-proof protections for gas or water pipes, and cement felting, which can be laid on with a trowel, for the covering of steam pipes, boilers or stills. In some of these cases, where it is only necessary to retain the heat, the asbestos is mixed with other substances; but where the protection must be fireproof as well, only asbestos is used. The utility of such covering is well illustrated in the heating system of railway cars. The main pipe from which the individual cars draw their respective supplies is protected by this material.

"To the electrical engineer, asbestos is absolutely indispensable. Many parts of electrical devices, and machinery, and wires through which the electric current passes become heated, and were it not for the electrical insulation and heat-resisting qualities which asbestos possesses, the apparatus would be completely destroyed, particularly in the case known to electricians as 'short-circuiting.' For such purposes it has been found advisable to combine asbestos with rubber and other gums, and this combination is now used generally for not only electrical, but also steam and mechanical purposes."

THE sinking of the engine shaft on the Josie, Rossland, B.C., is being steadily continued, and shows five feet of high grade ore in the bottom. A contract has been let for a 100-foot crosscut tunnel to tap this shaft at a depth of 120 feet.

THE directors of the Annapolis Manufacturing Co., Lequille, N.S., are: Robie Uniacke, president of the Halifax Banking Co., president. Thomas Ritchie, vice-president of the Merchants Bank of Halifax; Charles Archibald, director of the People's Bank of Halifax; James E. Roy, of the Halifax Piano and Organ Co., vice-president, and Fred H. Oxley, of Bauld, Gibson & Co., merchant. James Pennington was appointed the secretary-treasurer of the company.