over 33 per cent. The Seaforth Highlanders were a little better off, 169 of their bayonets and some sergeants' swords being condemned. The Lancashire regiment had 600 bayonets examined, of which 223, or rather more than 37 per cent, were found to be unfit for use. Altogether 2,000 bayonets were tested, out of which 611 had to be condemned. This number, taken at random from the regiments which happen at the moment to garrison Aldershot, is sufficiently large to be considered a fair sample of the whole supply of bayonets to the British army.

The London *Times* reaches the very unpleasant conclusion that three bayonets in every ten, or, to be accurate, 3,055 bayonets in every 10,000, now in the hands of the British army in all parts of the world, will fail the English soldiers in the hour of need. Or, to put it another way, England, which spends such enormous sums upon its army, may reckon that it has at this moment an entire army corps supposed to be fit to go anywhere and do any thing, equipped with weapons which will double up like a pewter spoon under the impact of a fanatical Arab.

Nor is even this all. The public may be excused for entertaining some suspicions as to the quality of the bayonets which have passed the test. How many of them, the *Times* asks, have just escaped condemnation, and how many are in fact what they are in theory, and what the English government pays to make them, — the best article that can be produced alike as to material and workmanship? It would be decidedly curious were there no intermediate grades to be found between a first-class weapon and one visibly and unmistakably worthless. The probability is that there are many; and until there exist assurances to the contrary, much more convincing than any yet produced, men of business will be disposed to doubt whether the percentage of unexceptionable bayonets is as great as that of downright bad ones.

FARTHEST NORTH.

TAKING all things into consideration, the Greely expedition was the most unfortunate expedition that ever entered the Arctic. Newfoundland was scarcely lost to sight when the men began to grumble about their food. Before the Proteus left Lady Franklin Bay, the second in command quarrelled with his chief. Unfortunately he failed to catch the returning steamer, and remained to add a gloom to the terrible gloom of the arctic night, and to add one more to the useless sacrifice on Cape Sabine. He soon found a confederate in the naturalist, and the two rarely spoke to Greely and Lockwood, the other occupants of the officers' quarters. Kislingbury and Pavy are both dead. We hope that Major Greely will go to the bottom of this matter, and tell us the true cause of so much discontent.

The next great misfortune which overtook the expedition was the death by starvation of the greater part of the force, owing either to the criminal negligence, or no less criminal ignorance, of those who had the relief in charge. The bodies of the dead heroes were brought to this country; but, before they were laid at rest, a noisy celebration was held in honor of the survivors. All honor to Brainerd, to Greely and the rest, but surely they would have preferred to have had better taste displayed in the matter. And now one of the foremost men of that party, a man whose name will forever rank with that of Payer in the annals of arctic discovery, has been most signally unfortunate in his biographer. No doubt, Mr. Lanman, if he had taken the time and care, and had possessed the requisite knowledge, might have written a good book; but the haste with which the present volume has been stuck together is apparent on every page. What is still more to be regretted is the omission of facts and descriptions which would have been interesting and useful to those familiar with the story of arctic exploration. Nevertheless, Mr. Lanman has printed many passages from Lockwood's journal, and there is much in them worth reading and thinking about.

The most noticeable thing in the book is the ease with which Lockwood, Brainerd, and the Eskimo Fredericks accomplished a journey to do a portion of which had cost Beaumont and his Englishmen so much suffering and disease. Why did the scurvy attack Beaumont's party, while leaving Lockwood, and in fact the whole expedition, entirely free? Surely no one will ever question Beaumont's energy and pluck. But why did he fail where Lockwood succeeded? It seems to us that this would be a profitable subject for the pens of Commander (now Captain) Markham, and his cousin (not brother, as Mr. Lanman says), the well-known secretary of the Royal geographical society, Clements R. Markham, — more profitable, indeed, than the assertions that Lockwood did not go farther north than Markham, and farther north and east than Beaumont. Lockwood thought that the weight of Beaumont's travelling equipment was enough to have used up any men. For our part, it seems probable that the cause lay deeper, and should be looked for in the difference between the winter quarters and diet of the two sets of men.

Farthest north; or, The life and explorations of James Booth Lockwood, of the Greely arctic expedition. By CHARLES LANMAN. New York, *Appleton*, 1885. 16°.

Another interesting statement is the following, from Lockwood's diary, as to the relative merits of Kane and Hayes: "Have been reading Kane and his travels. He is my *beau ideal* of an arctic traveller. . . . Hayes does not compare with him. Though beautifully written, there is an air of exaggeration about Hayes's book which destroys its interest. Dr. Pavy, who has hitherto been the advocate of Hayes, since his return from Carl Ritter Bay, seems to have changed his mind about him, and now agrees with Greely and me that Hayes never reached Cape Lieber. To have done so, he must have performed in part of his journey ninety-six miles in fourteen hours, — an impossibility." This, be it understood, is from Lockwood's diary as given by Lanman. The volume further contains a good portrait of the explorer, a poor map of his explorations, and no index.

THURSTON'S MATERIALS OF CONSTRUCTION.

THIS work, the author states in his preface, is an abridgment of the larger work by the same author, entitled 'Materials of engineering.'

It contains in a compact form for ready reference a large amount of valuable information concerning the properties of materials used in engineering constructions, and is undoubtedly one of the most complete works of the kind yet published in this country.

Students and practical engineers can hardly find any compilation better suited to supplement their theoretical text-books on the mechanics of engineering constructions than this. The work is not free, however, from some of the imperfections and faults which have characterized nearly all books of this kind, heretofore produced, by English and American authors. The title which is given to a text-book is perhaps of little consequence in itself; but under the titles 'Theory of strains,' 'Strength of materials,' 'Mechanics of materials,' etc., we have a variety of works, some of which are devoted to the exposition and demonstration of the theorems of applied mechanics relating to the action of external forces upon the parts of structures, and the resistances which oppose such forces, with a minimum amount of space devoted to the properties of the materials used; and in others the properties of materials, more or less fully treated, with a minimum amount of demonstration of mechanics so applied, but with working formulas, either introduced without demonstration or from experiments, — empirical formulas, — largely interspersed. This mingling of engineering constants and descriptions of the properties of materials with both demonstrated and empirical formulas, is perhaps necessary in such a work as that of Professor Thurston; but it requires great discrimination and art to accomplish this satisfactorily. The handbooks of Trautwine and Haswell are exceedingly useful works of this character. Professor Thurston aims to go a step farther in his formulas and explanations; but the mixing-up of theoretical demonstrations and formulas without demonstration is a fault in a text-book for students.

Some subjects are treated at great length, while others receive less notice; as, for example, those connected with metallurgy on the one hand, and the non-metallic materials on the other.

The introduction of pictures of a few of our most common trees, etc., in illustrations of timber, are out of place, and affect the character and dignity of the work, as such imperfect illustrations of familiar objects, seen almost daily and hourly in nature, are apt to prejudice the reader against the author.

Notwithstanding these defects, however, the work is a very valuable contribution to engineering as a book of reference for nearly all important questions connected with the properties of materials.

Text-book of the materials of construction. By R. H. THURSTON. New York, *Wiley*, 1885. 8°.

EXPLORATIONS IN ALASKA BY THE BROTHERS KRAUSE.

AMONG explorations in Alaska of late years, not purely for geographical purposes, the journey of the brothers Krause, under the auspices of the Bremen geographical society, holds a prominent and worthy place. Its progress was noted and its results chronicled from time to time in our pages. Numerous papers by the travellers themselves have appeared in European journals, the last being an account of the brachiopods and lamellibranchiate mollusks collected in Bering Sea and Strait, by Dr. Arthur Krause. Kurtz, Peters, von Martens, Reinhard, Hartlaub, Müller, Meyer, Richters, Arzruni, Poppe, and Kirchenpauer have reported from time to time on the natural history, mineralogy, and ethnology of the expedition. The volume under review is a consensus of all available information, both historical and recent, relating to the very interesting group of aborigines which occupy the greater part of the Alexander archipelago, with outlying villages as far north-west as the Copper River. It does not pretend to monographic com-

Die Tlinkit-Indianer. Ergebnisse einer reise nach der nordwestküste von Amerika und der Berings-strasse, ausgeführt im auftrage der Bremer geographischen gesellschaft in den jahren 1880–81, durch die Doctoren Arthur und Aurel Krause, geschildert von Dr. AUREL KRAUSE. Jena, *Costenoble*, 1885. 16+420 p., illustr. 8°.