absorption of power to be caused by the yielding nature of the materials of which projectiles are usually formed; but further experiments are required to complete the inquiry.

Whilst speaking of the subject of gunnery, I must pay a passing tribute of praise to that beautiful instrument invented and perfected by Major Navez of the Belgian Artillery, for determining, by means of electro-magnetism, the velocity of projectiles. This instrument has been of great value in recent investigations, and there are questions affecting projectiles which we can only hope to solve by its assistance. Experiments are still required to clear up several apparently anomalous effects in gunnery, and to determine the conditions most conducive to efficience both as regards attack and defence. It is gratifying to see our Government acting in accordance with the enlightened principles of the age by carrying on scientific experiments to arrive at knowledge, which, in the arts of war as well as in those of peace, is proverbially recognized as the true source of human power.

Prof. Tyndall's recent discoveries respecting the absorption and radiation of heat by vapours and permanent gases constitute important additions to our knowledge. The extreme delicacy of his experiments and the remarkable distinctness of their results render them beautiful examples of physical research. They are of great value as affording further illustrations of the vibratory actions in matter which constitute heat ; but it is in connexion with the science of meteorology that they chiefly command our attention. From these experiments we learn that the minute quantity of water suspended as invisible vapour in the atmosphere acts as a warm clothing to the earth. The efficacy of this vapour in arresting heat is, in comparison with that of air, perfectly astounding. Although the atmosphere contains on an average but one particle of aqueous vapour to 200 of air, yet that single particle absorbs 80 times as much heat as the collective 200 particles of air. Remove, says Prof. Tyndall, for a single summer night, the aqueous vapour from the air which overspreads this country, and you would assuredly destroy every plant inca pable of bearing extreme cold. The warmth of our fields and gardens would pour itself unrequited into space, and the sun would rise upon an island held fast in the grip of frost. Many meterological phenomena receive a feasible explanation from these investigations, which are probably destined to throw further light upon the functions of our atmosphere.

Few sciences have more practical value than meteorology, and there are few of which we as yet know so little. Nothing would contribute more to the saving of life and property, and to augmenting the general wealth of the world, than the ability to foresee with certainty impending changes of the weather. At present our means of doing so are exceedingly imperfect, but, such as they are, they have been employed with considerable effect by Admiral Fitz-Roy in warning mariners of the probable approach of storms. We may hope that so good an object will be effected with more unvarying success when we attain a better knowledge of the causes by which wind and rain, heat and cold are determined. The balloon explorations con-

ducted with so much intrepidity by Mr. Glaisher, under the auspices of the British Association, may perhaps in some degree assist in enlightening us upon these important subjects. We have learnt from Mr. Glaisher's observations that the decrease of temperature with elevation does not follow the law previously assumed of 1° in 300 feet, and that in fact it follows no definite law at all. Mr. Glaisher appears also to have ascertained the interesting fact that rain is only precipitated when cloud exists in a double layer. Rain drops, he has found, diminish in size with elevation, merging into wet mist, and ultimately into dry fog. Mr. Glaisher met with snow for a mile in thickness below rain, which is at variance with our preconceived ideas. He has also rendered good service by testing the efficiency of various instruments at heights which cannot be visited without personal danger.

The facility now given to the transmission of intelligence and the interchange of thought, is one of the most remarkable features of the present age. Cheap and rapid postage to all parts of the worldpaper and printing reduced to the lowest possible cost-electric telegraphs between nation and nation, town and town, and now even (thanks to the beautiful invention of Prof. Wheatstone) between house and house-all contribute to aid that commerce of ideas by which wealth and knowledge are augmented. But while so much facility is given to mental communication by new measures and new inventions, the fundamental art of expressing thought by written symbols remains as imperfect now as it has been for centuries past. It seems strange that while we actually possess a system of short-hand by which words can be recorded as rapidly as they can be spoken, we should persist in writing a slow and laborious long-hand. It is intelligible that grown-up persons who have acquired the present conventional art of writing, should be reluctant to incur the labour of mastering a better system; but there can be no reason why the rising generation should not be instructed in a method of writing more in accordance with the activity of mind which now prevails. Even without going so far as to adopt for ordinary use a complete system of stenography, which it is not easy to acquire, we might greatly abridge the time and labour of writing by the recognition of a few simple signs to express the syllables which are of most frequent occurrence in our language. Our words are in a great measure made up of such syllables as com, con, tion, ing, able, ain, ent, est, ance, &c. These we are now obliged to write out over and over again, as if time and labour expended in what may be termed visual speech were of no importance. Neither has our written character the advantage of distinctness to recommend it: it is only necessary to write such a word as "minimum" or "ammunition," to become aware of the want of sufficient difference between the letters we employ. I refrain from enlarging on this subject, because I conceive that it belongs to social more than to physical science, although the boundary which separates the two is sufficiently indistinct to permit of my alluding to it in the hope of procuring for it the attention which its importance deserves.

Another subject of a social character which demands our consideration is the much-debated ques-