PROCEEDINGS
OF THE
GEOLOGICAL & POLYTECHNIC SOCIETY
Of the West-Riding of Yorkshire,
AT THE ANNUAL MEETING, HELD IN THE PHILOSOPHICAL HALL,
LEEDS, ON WEDNESDAY, DEC. 15TH, 1852.

JOHN HOPE SHAW, Esq., Mayor of Leeds, in the Chair.
His Worship opened the business of the meeting by observing, that he was very sensible of the honour of being placed in the chair, but not so self-deluded as to mistake the grounds on which alone the Society would be justified in conferring such an honour, or he in accepting it. It could not be from any expectation of assistance from him in their scientific pursuits, his knowledge of which was only that general acquaintance with principles common to men of liberal education; enough to enable him to relish scientific discussion by others, but not to take a part in it. He could only have been selected for the chair on account of his public office in the borough, and of his having been formerly the President of the Society in whose hall they were assembled, and being still one of its vice-presidents, and a member of its Council. He then proceeded to remark on the high place of Geology amongst physical sciences, as second only to astronomy;—not, indeed, comparable with it in sublimity, (for the highest sublimities of earth sink into insignificance in comparison with the magnificence of that universe in which the earth itself was but a speck), but still presenting to us a series of wonders that must strike the mind with profound admiration.
It unfolded to us the process by which the present structure of the earth was formed; the order of its strata; the alternate elevation and depression of land and sea; the causes which had moulded its surface into the various forms it now presents to us; the tremendous convulsions which (at least when they happened suddenly) must have been fatal to animal and vegetable life, but which experience has shown to be blessings to us, since it was by their means that our vast mineral treasures were brought within our reach; and it exhibited to us, preserved as fossils, the framework of the bodies of the enormous creatures which inhabited the earth, and doubtless enjoyed their habitation, before it was fitted for man; and the prints of their footsteps on the primeval sand. But this Society aimed at applying science to uses more directly practical; and addressing, as he was then doing, an audience composed partly of visitors, unacquainted, or imperfectly acquainted, with the precise objects and operations of the Society, (as he himself was till he read its reports within the last two days), he did not think he could do any thing better than state the impression which the perusal of those reports had made upon his mind. He found that the Society had three main objects. The first was to ascertain Geological facts connected with our own district. Every one must admit that facts are the only sound foundation of physical science; but this, which is almost a truism with regard to physical science in general, has a peculiar significance with regard to Geology. In other physical sciences, when we have, by a sufficiently large induction, ascertained the existence of a general cause, we may, to a considerable extent, reason safely from cause to effect. Not so in Geology. There the regular operation of well-ascertained general causes was liable to so many interruptions from disturbing causes which were irregular in their operation, that the only safeguard against serious, and sometimes ruinous, mistakes, was to
recur again and again, at every step, to the test of actual experiment, and to make our information (as the prospectus of the Society recommends) “minute and local.” The second object of the Society was Polytechnic; or, in other words, the application of the means provided by art to the resources provided by nature, so as best to mould them to the uses and support of the great human family. To this head, one of the papers announced for that evening, on “The Iron Manufacture,” would be devoted. The Society’s third object was to ameliorate the moral and social condition of that large, and in a great degree isolated, class, who spend their lives in raising, or fitting for their appointed uses, the mineral products of our country. The mode in which the Society had prosecuted these objects appeared from the series of their papers, several of which he had had the pleasure and advantage of reading; and which, he thought, no one who had any taste for such studies, could read without admiration of the acuteness, research, and enlightened benevolence of the writers. There were papers on fossil remains; on our great mineral products, especially the two chief mineral products of our district, Coal and Iron; on the modes of working or using them to advantage, such as they would have that evening on the Iron Manufacture; on some of their principal applications in recent times, such as locomotives and their various improvements; on the different qualities of soil in different Geological Districts, on which class of subjects he was glad to see that Society in amicable intercourse with another important body, the Yorkshire Agricultural Association; on the qualities of water, a subject of great interest at all times, and at present of peculiar interest in Leeds; and, so far as regarded the workman, on improvements in his great protector from fire-damp, the Davy Safety Lamp, and on what, if thoroughly accomplished, might prove a still better protector to him, the ventilation of mines. These
papers, the productions of writers who brought to their subjects extensive practical experience as well as theoretical knowledge, followed by free but courteous discussions and the friendly interchange of opinion, in a meeting of men who combined science with practice, could not but be productive of great good. But much as had been done, there was still much remaining to be accomplished, before the vast treasures of mineral wealth, which a gracious Providence had placed under their feet, had answered all the purposes for which His wisdom and benevolence designed them. There were districts to be explored; maps to be formed; statistics to be collected; improvements to be suggested; and information to be widely diffused, in order to secure the full benefit of these treasures. In our own district, those treasures were now blessing many hundreds with opulence, and many thousands with the means of happy subsistence; but the continuance and extension of those blessings depended on the active and judicious use of the means to which they owed their origin. To cultivate such resources with success, united and systematic efforts were indispensable; and it was the province of that Society to unite and systematize, and by that union and that system, to promote and assist those efforts. Such a Society was well entitled to the support of all who were interested (and who is not?) in the welfare of the community to which they belonged. Whatever apathy might have appeared (and in this neighbourhood there was unfortunately but too much reason to regret such apathy) with regard to the Society, must, he was sure, arise from its objects and proceedings not being sufficiently known. In his own case it was unquestionably so; for he had been very imperfectly aware of the extent or nature of the Society’s labours till he read their Reports preparatory to taking the chair that evening; and the pleasure with which he had read them was not entirely unmixed with self-reproach, that such an institution had been
labouring so many years in the town where he lived, without his having sooner manifested his sense of its usefulness. This omission he hoped they would allow him to repair tonight by becoming a member; and he had no doubt that many of his townsmen, if they could be induced to read the Reports, as he had done, would gladly and eagerly do likewise.

The Treasurer produced the following statement of the Receipts and Disbursements of the Society for the past year.

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DR. £ s. d. CR. £ s. d.
To Balance in Treasurer's hands... 11 37 84 By Printing Reports............ 10 0 0
' " Mr. Batman's hands... 10 18 6 " Advertising Meetings........... 1 11 0
To Subscriptions from— " 1 Member for 1848, at 13s. ..... 0 13 0 " Lithographing Plates....... 2 11 6
' " 1847 " ..... 0 18 0 " Rent of Exchange Rooms... Bradford .................. 1 1 0
' " 2 Members for 1848 " ..... 1 6 0 " Expenses of Meetings .......... 2 2 6
' " 4 " 1849 " ..... 2 12 0 " Collecting Subscriptions ....... 3 1 2
' " 6 " 1850 " ..... 3 18 0 " Postage Stamps .............. 0 8 1
' " 35 " 1851 " ..... 22 15 0 " Subscription to the Palaeontographic Society .... 1 0 0
' " 80 " 1852 " ..... 52 0 0 " Rent of Museum Room ....... 20 0 0
" Cash for copies of papers printed 1 19 0 " Salary of Assistant Secretary.. 50 0 0
" Advertising Meetings ........ 1 11 0 " Sundry Expenses ........... 2 0 6
" Collecting Subscriptions ....... 3 1 2 " Balance in Mr. Batman's hands... 10 18 6
" Postage Stamps .............. 0 8 1 " Balance in Treasurer's hands... 3 16 11½

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The Chairman then called upon Mr. Solly to read—

**EXTRACTS FROM MISCELLANEOUS OBSERVATIONS ON THE MANUFACTURE OF IRON, AND ESPECIALLY ON CERTAIN QUALITIES AND PROPERTIES OF MALLEABLE IRON. BY RICHARD SOLLY, OF THE LEABROOK IRON WORKS, STAFFORDSHIRE, AND OF SHEFFIELD.**

I was induced to offer this slight paper, from frequent experience that many persons, even of extensive general information, and of high attainments in special scientific pursuits, are not aware of the great variety which exists in the properties of malleable iron, and which render one