CHAIRMAN'S ADDRESS, WITH OBSERVATIONS ON THE MINERAL ASPECTS OF THE WEST-RIDING COALFIELD. BY RICHARD CARTER, ESQ., C.E., F.G.S.

In addressing this assembly of the members of the West Riding Geological and Polytechnic Society, my first agreeable duty is, to bid you welcome to Barnsley; and next to congratulate the Society on the reanimation of its latent powers, fraught, as I believe them to be, with advantage and benefit to the vast and important district with which it is identified. Recent meetings of the Society at Halifax and Bradford, have afforded opportunities for explaining the interregnum, which has occurred in the ordinary meetings and operations of the Society; but it would border on ingratitude and negation of proper esteem for the long-sustained services of a most valuable officer, if I did not embrace the present opportunity of personally offering a tribute of respect to the memory of our late Secretary, Mr. Denny, and an expression of the high regard, in which his services to the Society are held by members in and around Barnsley.
Whilst, however, the reaping hand of Time is gathering one after another of those with whom we have loved to associate, in the work and labour of scientific progress, let us take courage from the fact, that good men and true are at hand, to fill the vacant chairs of those whose loss we mourn.

In our lamented friend Mr. Denny, we all know that the Society was bereaved of one whose devotion to science, in all its applications, was of the most earnest and sympathetic character.

Happily, however, for the promotion of all our future aspirations, we have worthy and most competent successors; in Mr. Louis C. Miall especially, we have one whose attainments have won him a well-defined mark in the scientific world, and whose kindness and generosity in promoting the acquisition of scientific knowledge, have established him in the esteem and regard of many laborious students in the West Riding of Yorkshire. I trust he may long enjoy health and satisfaction, in directing and promoting the aims and objects of this Society.

In this brief retrospect, forced by the absence of the Society for so many years from Barnsley and its immediate neighbourhood, we are reminded of many whose co-operation and society it is refreshing and agreeable to dwell upon. The late Rev. William Thorpe must always be remembered in connection with its history; and his elaborate Section of the Yorkshire Coal Field, will always remain as a testimony to his extensive research and accurate observation on its geological structure. No doubt the more recent publications of the Government Geological Survey display a more minute and exact record of our local stratification; and we hail the established residence amongst us of Professor Green, to whose careful investigation and accomplished skill, those records are chiefly due, as an unqualified pleasure and great local advantage. The published Sections of the Geological
Survey are doubtless familiar to all our members; and from their exact, mathematical delineation, they will have become the subjects of more frequent reference, and more confiding trust, than kindred productions which preceded them. There is, however, notwithstanding the quaint, and perhaps I might say eccentric, construction of Mr. Thorpe's Section or Diagram, a vast fund of information to be derived from it; and considering the time of its production, and the then proved knowledge and experience of our local Geology, it reflects a credit on our late townsman's genius and acquirements which time will rather strengthen than destroy; and as one of the founders and early supporters of this Society, the name of Thorpe will always serve as a binding link, between the Society and the locality of Barnsley, which has furnished so much material for its past investigation and record.

I must not dwell upon other familiar names of those who have been taken from us. That of Mr. Thomas Wilson, however, recurs with a melancholy force which we cannot resist, and carries us back to those good old days, which might perhaps be held to form a useful model for our imitation now. I refer, especially, to the arrangement which had all but formed the programme of our present assembly, when a social meal divided our introductory labours from an evening's discussion. This never failed in bygone days, to add greatly to our collective enjoyment, and stimulated the individual zeal we each felt, in all that pertained to the usefulness and progress of the Society's labours in the mining and commercial districts of Yorkshire.

The Chairman next spoke on the mineral aspect of the Coal-field of the West Riding. In the course of his remarks he said:—The experience of the last few years has added to our previous knowledge, and I think, established the striking change in character, which exists in the genera
stratification of our Coal-field, as divided by a line, running in an easterly and westerly direction, and coincident with the Calder Valley on the south side of Wakefield. The measures southward of this line may be said to characterise the *South Yorkshire*, or by way of distinction, I should prefer to style it, the *Barnsley Section*, or series of strata. Whilst those on the north side of the line, are more characteristic of what is known as the West Yorkshire Coal-field, and may be generally distinguished by Sections, which have long been associated with the several important seams, known as the “Stanley Main,” the “Middleton,” and the “Low Moor” Beds of Coal. These lines, of great physical distinction, are important on an occasion like the present, chiefly as affecting the identity of particular seams on each side of them. A few years have sufficed to solve many interesting doubts of this nature, which formerly excited geological controversy. As, for instance, whether the thick (9 feet) seam, familiarly known as the “Barnsley Bed,” which seems to find its northern limit, for all practical purposes, in the divisional line I have referred to, is not represented on the north side of such line, by the seams known as the Warren House and Gawthorpe Beds. This identity is now accepted. And I believe it is equally well established, by the results of more enlarged experience, that the Stanley Main Seam, on the north side of our divisional line, has its representative in the two distinct beds in the Barnsley Section, commonly known as the “Upper and Lower Beamshaw” Beds.

Such being the accepted facts, we get a clear and well-established definition, of the entire section of the West Riding Coal-field, from its upper or latest deposited beds, (the Glass Houghton and Shafton Beds), down to the level or zone of the “Barnsley Coal.” In this we may assume an aggregate thickness of 400 or 500 yards of various stratifications. These include, besides the several beds of coal, too well
The "Silkstone Coal" may safely be said to have acquired a household name and reputation throughout the United Kingdom. The purity of its mineral composition, and the generous thickness of the seam, combine to make it one of the grand hopes of South Yorkshire. No wonder, then, that as in the instance of its sister bed (The Barnsley), scientific skill should be exhausted in tracing it beyond, and to the north, of our imaginary line of transition, and that in the West Yorkshire section, we should be led with propriety and truth, to recognise one amongst its numerous members, which we could fairly affiliate as the true representative of the Silkstone bed. I may remark, parenthetically, that the parent name of this bed is scarcely to be controverted. Its natural outcrop in the village of Silkstone, would doubtless afford the first opportunity of ascertaining its qualities, and hence it obtained its primary definition and name.

I know that the task of carrying this important identification into the West Yorkshire district, is confessedly accomplished, and more than one instance exists, of important commercial results being realised, from the assumed identity...
of the Silkstone seam, with beds obtained in collieries to the
north of our imaginary line of separation.

Whether these authorities may all agree amongst them­
selves, and ultimately prove to be correct, is more than I can
venture to assert. I am free to admit that it is possible. But the evidence requires much care in its adequate collection
and examination before it is fully accepted. I know my
friend, Professor Green, has lent the importance of his high
authority to the “Blocking Bed,” a seam locally known in
the district of Dewsbury and Flockton, as the true representa­tive of the Silkstone, and his forthcoming Memoir, will doubt­less convey such reasons as will claim our deepest respect.

Mr. Thorp’s diagram may also be referred to, as confirming
this identity.

I will, however, anticipate the pleasure with which I am
sure Professor Green’s work will be hailed, by suggesting a
line of investigation, which it is just probable he may not
have pursued. I will now refer to that analogy, which may
or may not be traced, between the lower members of the West
Riding section, by pursuing them upwards from the great
Millstone Grit base, which is well defined along the western
and northern boundaries of our entire Coal-field, and extend­­ing from Sheffield in the south, by Huddersfield, Halifax, and
Denholme, in the west, to Kirkstall, Horsforth, and Thorner,
in the north.

It is not a little remarkable, that along this extended line
of country, the two Halifax beds (the Hard Bed and the Soft
Bed Coals) are to be traced in consistent relation to the out­
cropping Grit-stone, which lies in varying thicknesses of 15
to 25 or 30 yards, below the Soft or lower bed. The Halifax
beds are overlaid by a series of alternating shales and
bind, interspersed with a few very thin, but distinctive
“bands” of coal, and generally, acquiring an aggregate
thickness of 150 to 200 yards. The section then receives, in
its ascending order, an equally persistent stratum along the entire margin of our Coal-fields, and well known as giving origin to the important flagstone quarries of Green Moor, Elland Edge, North and Southowram, Clayton, Bradford, Armley, and Leeds.

Having then obtained, in its ascending order, the continuous and important stratum of the Flag and Slate, we have what may be accepted as a higher and substituted base, for the Coal-measures proper of the West Riding Field. Below the Flagstone, as we have already seen, there exists only the two Halifax beds of workable coal. All our mineral deposits of any real commercial importance are, therefore, subsequent in date, and are super-imposed upon the Flag-stone stratum. Taking the southern district, separated by our imaginary line of division, we find the Whin Moor Coal the first in order, and after that the Silkstone, which is followed in turn by the Park Gate, Flockton, Swallow Wood and other seams, which lie between the Silkstone and Barnsley beds. In the Northern District, we find the Flag-stone is first overlaid by the two important seams, known as the Low Moor Better and Black Bed Coals; these are followed in order, by the several beds characteristic of the Gildersome, Morley and Dewsbury fields; and it is amongst these, that the identity of the true Silkstone seam is to be traced. This, doubtless, will soon be accomplished, and so by the rapid spread of colliery workings in the district, the identity will be made complete.

In connection with the extent of our Coal-field, it is essential that I should direct attention to, and put on record, the rapid strides by which our experience has been advanced in the past two or three years. In this period of time, a totally unprecedented amount of capital and enterprise have been attracted to the South Yorkshire district, and in the area of coal leased, and number of new collieries estab-
lished, all previous history has been totally eclipsed. Twenty years ago, our knowledge of the “Thick Coal,” in the vicinity of Barnsley, was almost confined to collieries which were directly upon, or merely skirted the outcrop of the seam. It was subsequently extended by the opening out of collieries, pursuant of the “dip,” from the locality of Worsborough, to the district of Wombwell and Lund Hill. It remained, however, for the extraordinary stimulus, arising from the condition of the coal and iron trades, some two or three years ago, to push the “Barnsley and Silkstone seams” into prominent notice; and in that brief interval, the vast extent of area leased, has carried the collieries by one huge impulse, from the practical horizon of the town of Barnsley to that of the Midland Railway. In this transition, it would not be unfair to say, that a fresh demand upon our unexplored, and therefore unexhausted treasury, has been made to an extent of country, measuring eight miles in length by two miles in breadth, or upwards of ten thousand acres; and if this were regarded with reference to the Barnsley-bed alone, it would represent in weight, about one hundred million tons of coal, bespoken from our natural resources within the last four or five years.

The Midland Railway, however, has also been exceeded, and two examples may be specially referred to, where the Barnsley-bed has been leased, and pits are now being sunk, with the view of working the Barnsley-bed to the eastward, and upon the “dip” from the parallel of the railway. I mean the Monkton Main, and the colliery which is being opened up at South Kirby, the latter being at least seven miles in the “dip” direction, from the lowest colliery established in the locality of Barnsley.

We regard the prosecution of the two last mentioned projects with peculiar interest, as tending to increase our knowledge of the probable extent of our coal-field in an
easterly direction. It is a subject which opens up a rare amount of speculation, and well deserves the most careful and intelligent investigation. The probabilities are, that we have in this momentous question, results of national, as well as local importance, which would startle the most sanguine anticipations; and I know of no institution, so appropriate as our own, for treasuring the practical results of experience, and encouraging the processes of exact observation, upon their gradual development.

In hastening to a conclusion, I cannot withhold reference to operations which, even in the current year, have greatly added to our previous acquaintance with the importance and area of the Silkstone Seam, in the South Yorkshire District. The Barrow and Hoyland Silkstone Companies have both revealed the presence of the Silkstone Seam, by the spirited enterprises in which they have engaged, in the localities of Worsborough and Hoyland Nether. And here again, having reference to the previous winnings, we have an immense accession to the proved territory, over which this very important seam is known to extend. By the kindness and courtesy of my friends, Messrs. Kell, I am able to direct the attention of the members and friends present to a vertical section of the strata through which the Barrow Company’s shaft has been sunk to a depth of 460 yards from the surface; and we shall all unite, in heartily congratulating the two Companies, on the very satisfactory results, which have followed upon the intelligent enterprise.

There remains only one subject more to which I can stay for a passing observation. It is that of greater safety in carrying on the operations connected with Coal Mining. Surely something may yet be done to diminish the risk, if not altogether prevent those sad fatalities, which thrill through our deepest sympathies. The Polytechnic aspect of our Society, should give encouragement to labourers in this most
inviting field of research; and I do hope, that the gathering here to-day, in this most central town of the South Yorkshire district, may result in a deep and wide-spread feeling of fellowship and good will, and that a great accession to the list of our members, may show that the public and scientific interest of the West Riding, is being actively and effectively exerted, in sustaining the growth, and promoting the influence, of the Geological and Polytechnic Society.

ON A SECTION OF BOULDER CLAY, NEAR BARNESLEY. BY A. H. GREEN, M.A., F.G.S., PROFESSOR OF GEOLOGY IN THE YORKSHIRE COLLEGE OF SCIENCE, LEEDS. (PLATE VII.)

It is very well known that the distribution of drift, on opposite sides of the southern portion of the Pennine range of hills, is very unequal. While all the low-lying grounds of Lancashire and North Staffordshire, are thickly covered by broad sheets of Boulder Clay, Sand, and Gravel, the corresponding tract of the Yorkshire and Derbyshire Coal-field is all but a driftless area. Drift, however, is not altogether absent from the plains east of the Pennine ridge, and of the scattered patches which have been detected here and there in this district, one of the most remarkable is the deposit which it is the object of this paper to describe. It was laid open in the cutting of a mineral railway near the Carlton Lane Tollgate on the Barnsley and Wakefield road, about two miles north of Barnsley, and the section of that part of the cutting in which the drift bed occurs is shown in Plate VII.

On the south, the section traverses the Woolley Edge Rock and the underlying Woodmoor Coal, and we soon reach the