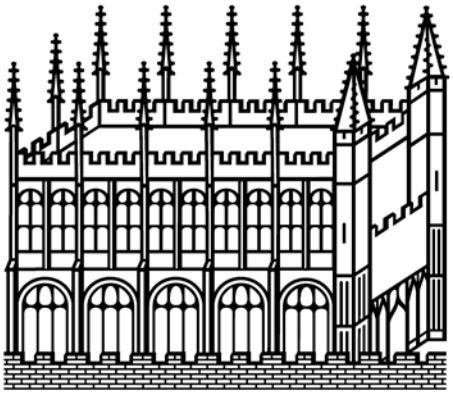

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CONTENTS

	PAGE
INTRODUCTION - - - - - - - -	xxiii
THE PHYSICAL FEATURES AND GEOLOGY OF CENTRAL WALES. PROF. O. T. JONES, D.SC. -	25
THE HUMAN GEOGRAPHY OF CARDIGANSHIRE. PROF. H. J. FLEURE, D.SC. - - - - -	52
THE LAND FLORA OF CARDIGANSHIRE. PROF. R. H. YAPP, M.A. - - - - - - -	71
THE MAMMALS, BIRDS AND BUTTERFLIES OF NORTH CARDIGANSHIRE. J. H. SALTER, D.SC. - -	88
MARINE LIFE OF THE SHORES OF CARDIGANSHIRE. C. L. WALTON, H. J. FLEURE, F. S. WRIGHT -	97
MEDIÆVAL BUILDINGS IN CARDIGANSHIRE. PROF. E. TYRRELL GREEN, M.A. - - - - -	111
HISTORY OF ABERYSTWYTH. EVAN EVANS - -	134
THE CASTLE OF ABERYSTWYTH. E. A. LEWIS, D.SC. - - - - - - - - -	152
ABERYSTWYTH AS A HEALTH RESORT. ABRAHAM THOMAS, M.B. - - - - - - -	165
GOGERDDAN. EVELYN LEWES - - - - -	170
LITERARY ASSOCIATIONS OF ABERYSTWYTH - -	174
UNIVERSITY OF WALES. PROF. E. ANWYL, M.A.	180

PAGE

THE CENTRAL WELSH BOARD FOR INTERMEDIATE EDUCATION. PROF. E. ANWYL, M.A. - - 185

THE NATIONAL LIBRARY OF WALES. JOHN BALLINGER, M.A. - - - - - - - 193

THE UNIVERSITY COLLEGE OF WALES - - - 203

THE UNIVERSITY COLLEGE AND AGRICULTURAL EDUCATION. PROF. C. BRYNER JONES, M.SC. - 219

ST. DAVID'S COLLEGE, LAMPETER. REV. PRINCIPAL BEBB, D.D. - - - - - - - 228

EDUCATION IN CARDIGANSHIRE. JENKIN JAMES, M.A. - - - - - - - - - 232

LLEDROD, YSTRAD MEURIG AND LAMPETER SCHOOLS. REV. PRINCIPAL BEBB, D.D. - 245–6

AN OLD ABERYSTWYTH SCHOOL - - - - 247

BILINGUALISM IN THE SCHOOLS. T. GWYNN JONES - - - - - - - - - 249

THE VALE OF RHEIDOL—THE DEVIL'S BRIDGE—HAFOD - - - - - - - - - 256

THE G.W.R. - - - - - - - - 275

THE CORRIS RAILWAY - - - - - - 277

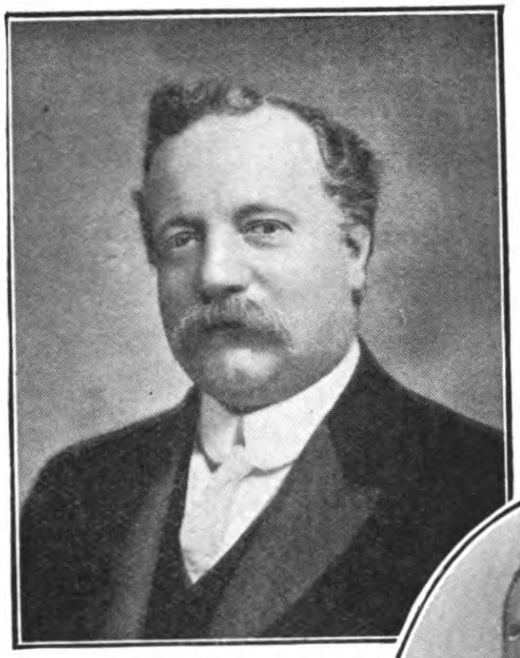
THE CAMBRIAN RAILWAYS - - - - - - 280

LIST OF ILLUSTRATIONS.

	PAGE
Miss I. Cleghorn, L.L.A., President -	*Frontispiece*
Mr. Marshall Jackman, Mr. C. W. Hole, Mr. G. M. E. Hamilton - - - - - - - - -	ix
Sir James Yoxall, M.P., Mr. F. W. Goldstone, M.P. -	x
Mr. C. James, Mr. E. Gray, M.A., Mr. W. Hollingsworth, B.A. - - - - - - - - -	xi
Mr. A. A. Thomas, B.A., Mr. H. Lynn, Mr. T. A. Organ, B.A., Mr. P. Nairne - - - - - - -	xii
Mr. F. C. Blackburn, Mr. A. Golding, Mr. P. Thomas, Mr. W. Bickerton - - - - - -	xiii
Mr. Tom John, M.A., Miss H. Williams, L.L.A., Mr. Rhys Nicholas - - - - - - - -	xiv
Mr. Matthew Lewis Vaughan Davies, M.P. - -	xv
The Mayor and Mayoress of Aberystwyth - -	xvi
The Deputy Mayor and Town Clerk of Aberystwyth - - - - - - - - - -	xvii
Alderman D. C. Roberts, Principal T. F. Roberts, Jenkin James, Esq., M.A. - - - - - -	xviii
Mr. D. J. Saer, Mr. H. H. Herring, Mr. C. H. Cocks, Mr. W. P. Elwy Jones - - - - - -	xix
Lady Webley Parry Pryse - - - - -	xx
Aberystwyth from Constitution Hill - - -	xxi
Tal-y-Llyn Lake and Cader Idris - - - -	xxii
Rheidol Valley - - - - - - - -	36
Hanging Tributary - - - - - - - -	38
Aberystwyth Grits - - - - - - - -	49
Minor Folding - - - - - - - - -	50
Caer Fawr, Trawscoed - - - - - -	55
Prof. W. Jenkyn Jones, M.A., Jenkin James, Esq., M.A., Prof. O. T. Jones, D.Sc., M.A. - - -	69
Pebble Ridge, Aberystwyth - - - - -	78
Llwyn-y-Garreg - - - - - - - -	80
Quercus Sessiliflora, Parson's Bridge - - -	82
Submerged Forest, Borth - - - - -	83
Pole Cat - - - - - - - - - -	90
Yspytty-Cynfyn Church - - - - - -	114
Llanwenog Church - - - - - - - -	115
Llanbadarn Fawr Church - - - - -	117
Cross in Llanbadarn Churchyard - - -	119

PAGE

South Door, Llanbadarn Church - - - - 120
Llanddewi-Brefi Church - - - - - - 122
Strata Florida Abbey, West Door - - - 124
Chancel of Cardigan Church - - - - - 130
Cliff Scenery - - - - - - - - - 135
Marine Promenade, Aberystwyth—Looking North 138
A Morning Ride - - - - - - - - 139
A Dash of Spray, Aberystwyth - - - - 142
Launching the Lifeboat - - - - - - 144
Sunset Across the Bay, Aberystwyth - - - 145
A Centenarian - - - - - - - - - 148
Cwm Woods, Aberystwyth - - - - - 149
The Castle of Aberystwyth - - - - - 153
Gogerddan - - - - - - - - - - 172
Letter from Ruskin - - - - - - 177
Black Book of Carmarthen - - - - - 194
National Library of Wales, Proposed Building - 195
First Book Printed in Welsh - - - - 197
First Book Printed in Wales - - - - 201
General View of College - - - - - 205
University College of Wales—Entrance - - 208
Alexandra Hall—Residence for Women Students - 211
Edward Davies' Memorial Laboratories - - 213
St. David's College, Lampeter - - - - - 229
Alexandra Road Council School, Aberystwyth - 233
Aberystwyth Church of England School - - 235
Llanwnen Council School - - - - - 237
County Intermediate School, Aberystwyth - - 241
John Evans' Mathematical and Commercial School, Aberystwyth - - - - - - - - - 248
The Vale of Rheidol - - - - - - 257
Rheidol Falls - - - - - - - - - 259
Falls of the Mynach—Devil's Bridge - - - 265
Monument by Chantrey, Eglwys Newydd - - 268
Hafod - - - - - - - - - - 271
Miners' Bridge - - - - - - - - - 273
Tal-y-Llyn, Upper End - - - - - - 276
Tal-y-Llyn - - - - - - - - - - 278
Waterfall in the Artists' Valley - - - 282
Harlech Castle - - - - - - - - 284



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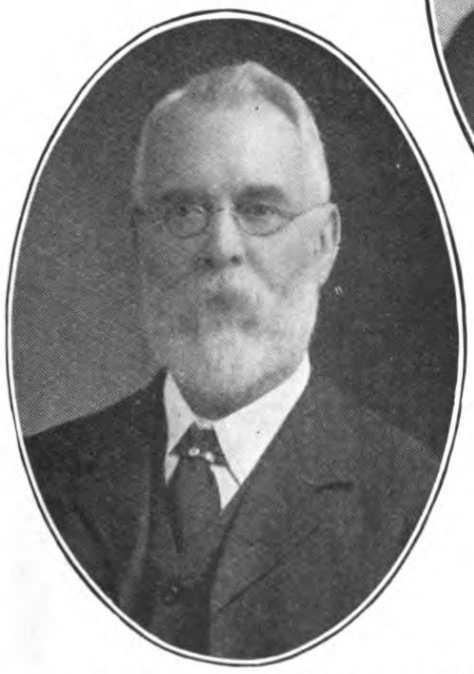

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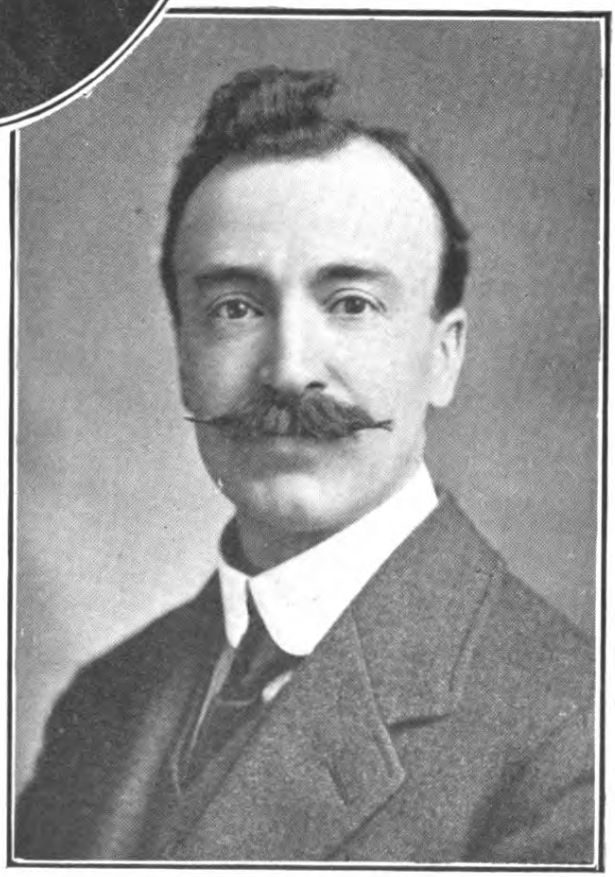

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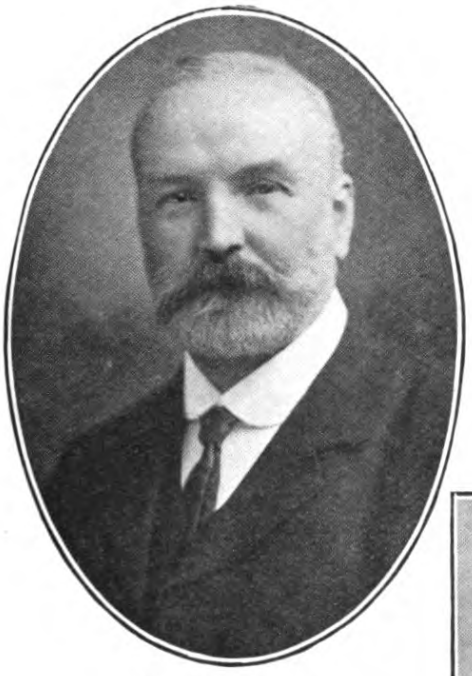

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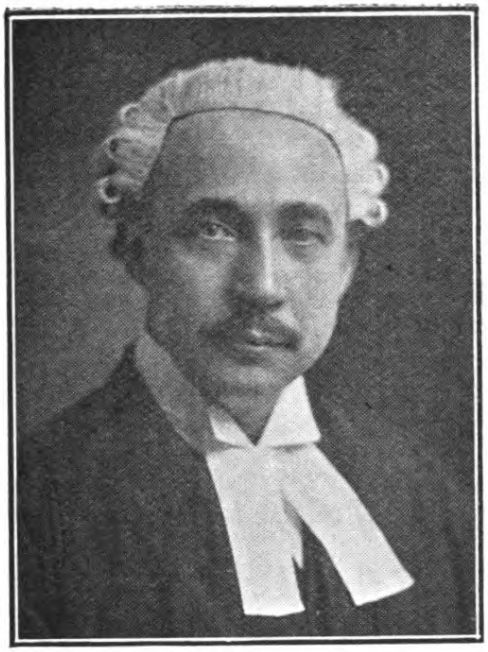

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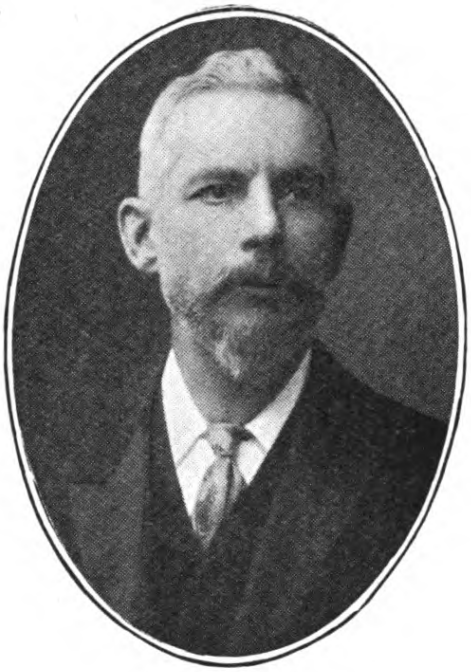

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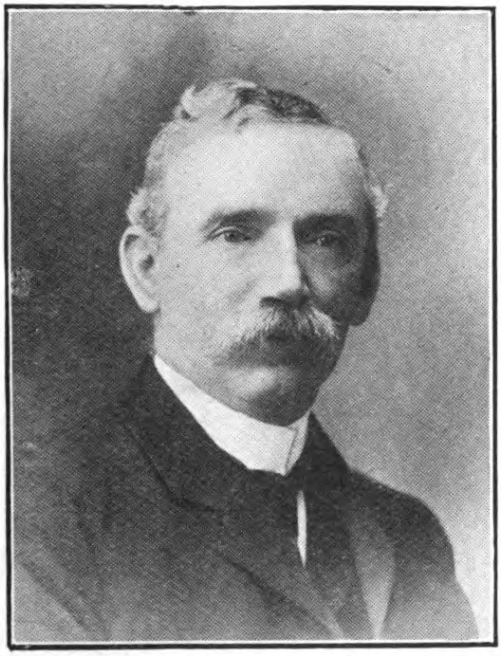

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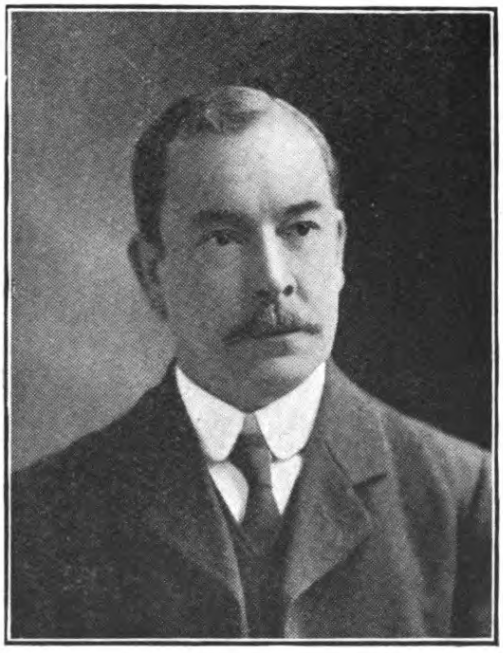

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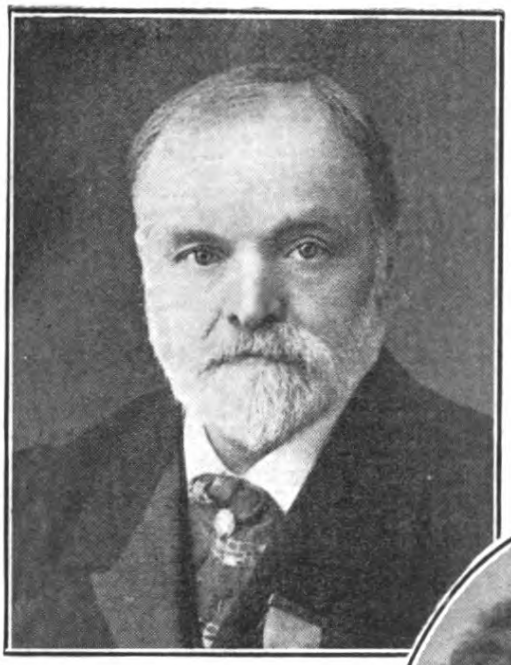

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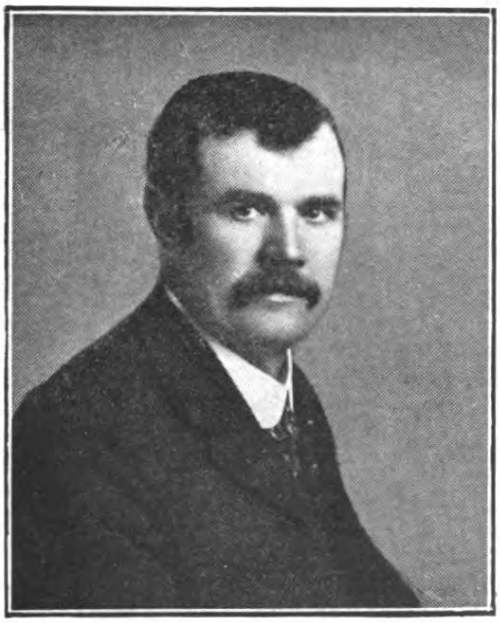

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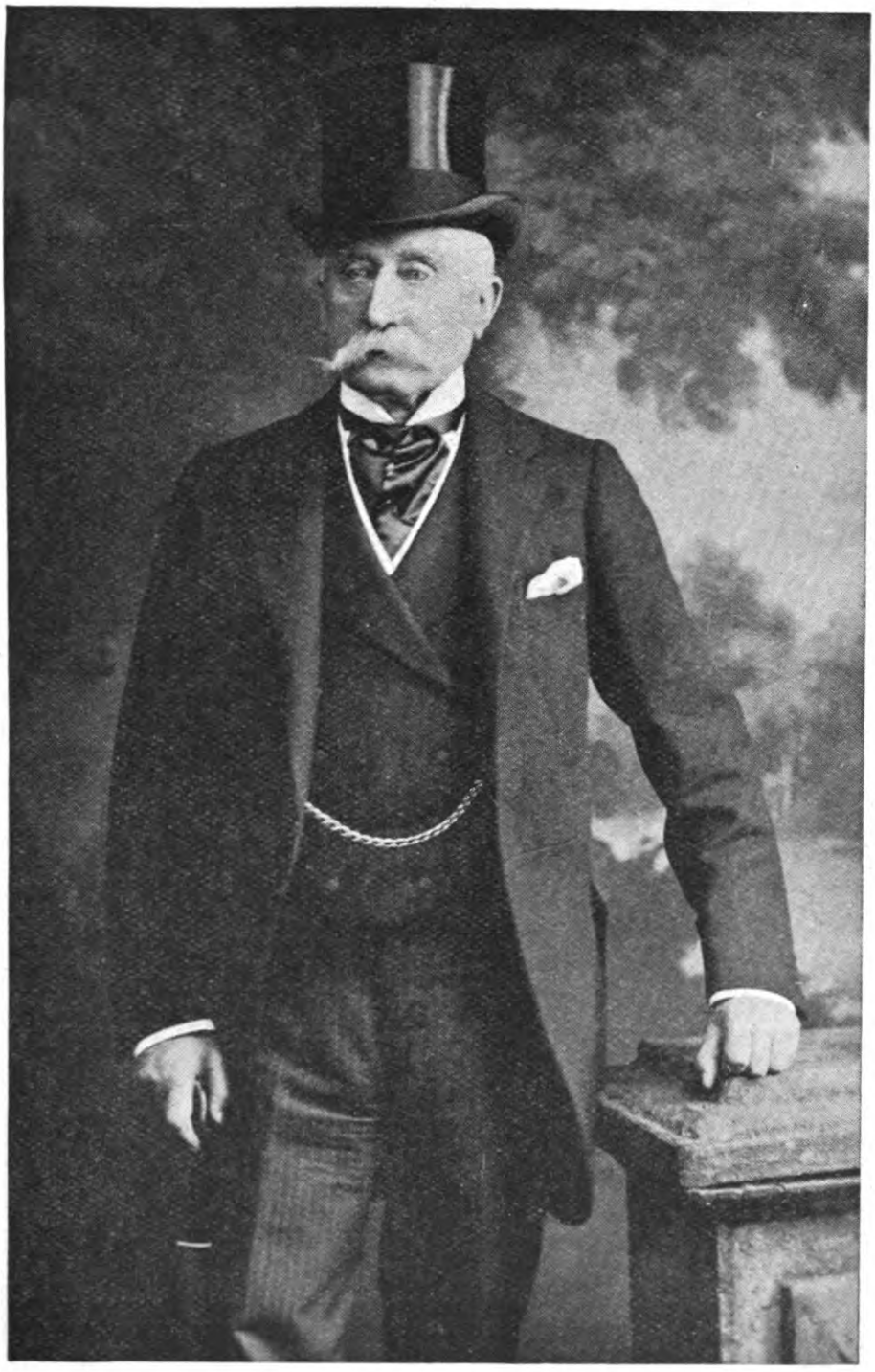

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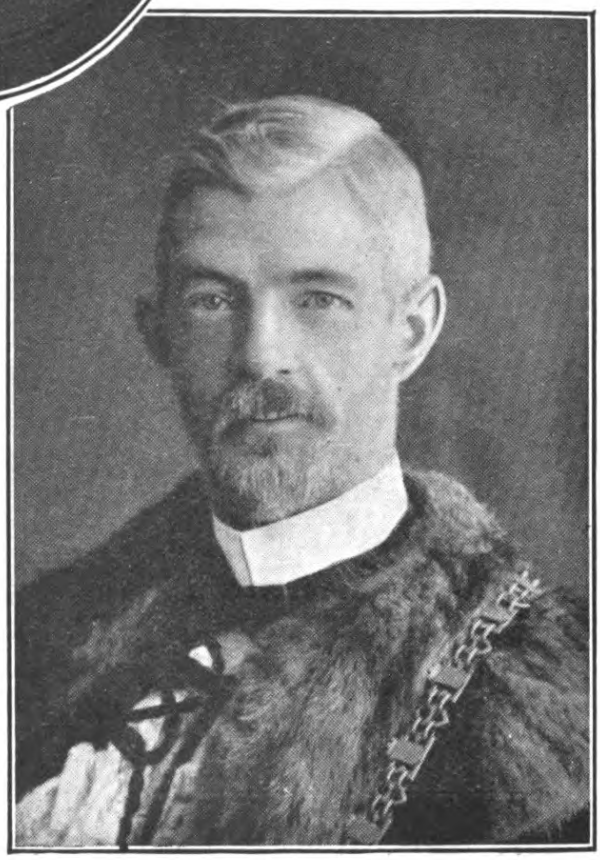

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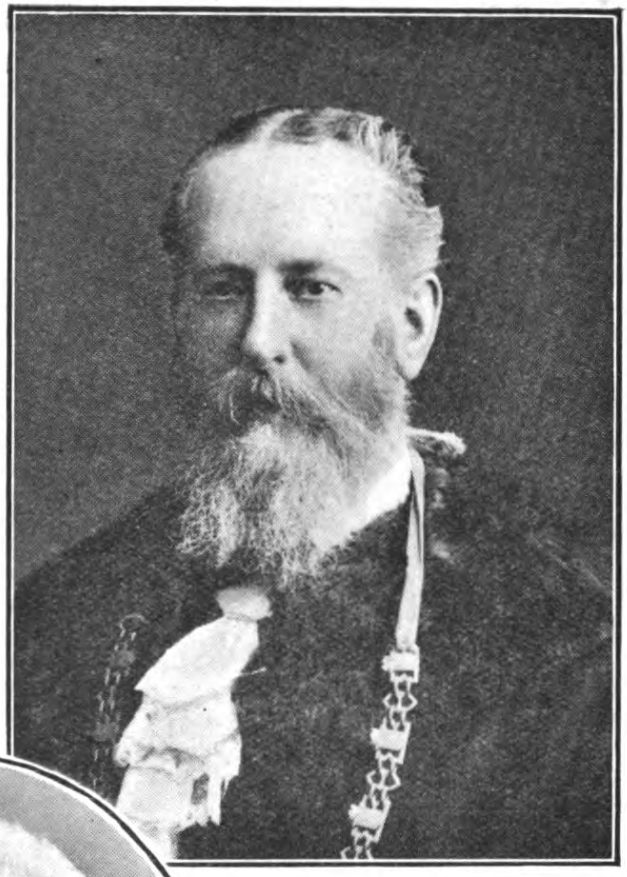

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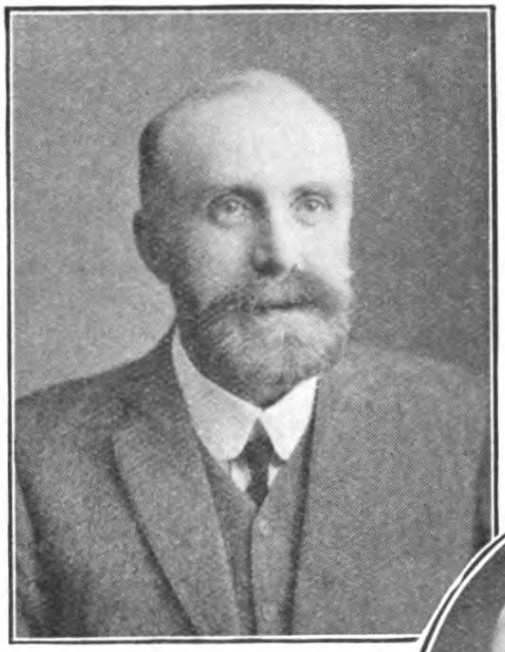

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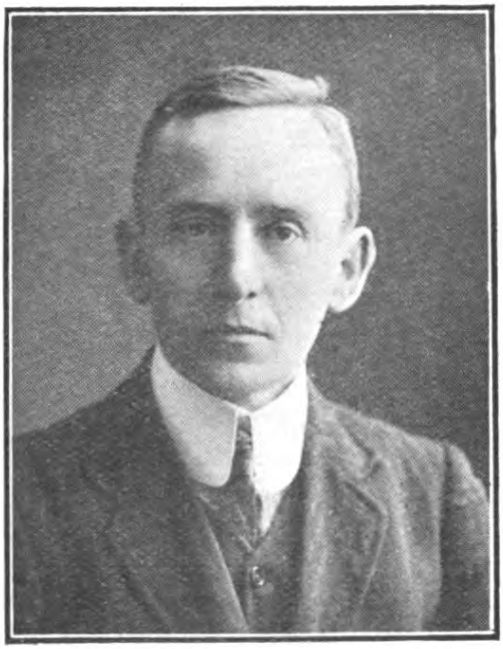

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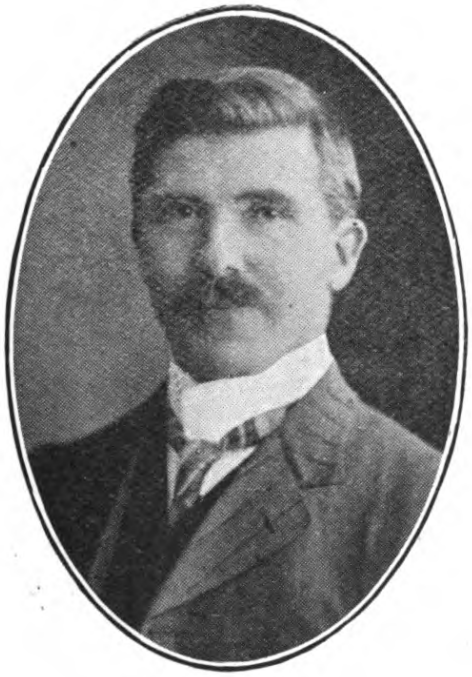

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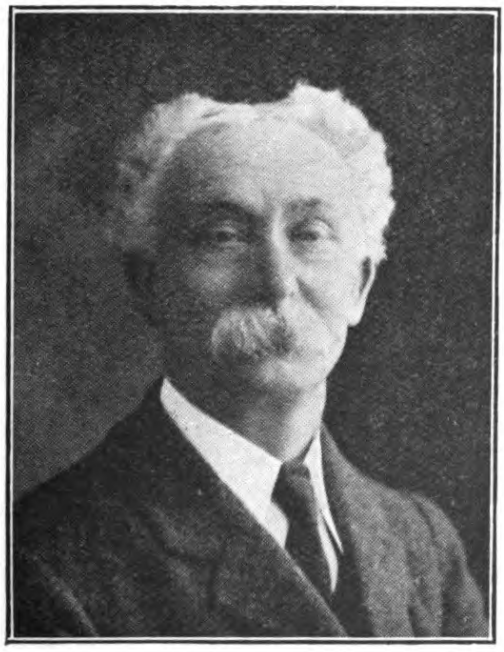

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Aberystwyth from Constitution Hill.

Tal-y-Llyn Lake and Cader Idris.

INTRODUCTION

THE district of North Cardiganshire, of which Aberystwyth is the chief town, has many features of interest for the observant visitor. Isolated by great chains of hills, its inaccessibility down to quite recent times has left undisturbed traditions, habits, customs and modes of life, which have elsewhere been obliterated by the advance of modern ideas.

In North Cardiganshire it is possible to meet with people to whom English is an utterly unknown tongue. and who can still make rushlights, sufficient to serve them for the only hours of dark they remain out of bed when the day's work is done.

Up to quite recently, possibly still, the witch doctor and the charmer were the advisers most consulted in affairs of certain kinds.

Peat is still largely used for fuel, and the old open hearth is to be found in most of the hillside farmhouses. The farmer still sends the wool from his own sheep to a local weaver, and may be wearing this year as cloth that which last winter kept his sheep from perishing of cold.

Defended by hills and boggy moorlands on its eastern border and by the sea on the west, this " land between the mountains and the sea " offered difficulties to the invader, whether Brython, Norman or Englishman, and the kingdom of Ceredigion, though often attacked and occasionally defeated, retained its territorial unity down to the Conquest of Wales by Edward I.

The influence of a separate existence extending over centuries, is still traceable in the attitude of the Cardiganshire people. Surrounded by the princedoms of Dyfed, Powys, and Gwynedd, Ceredigion was, like Belgium

and other small modern states, a buffer between more powerful neighbours, each of which occasionally overran it. This fact, added to the geographical position, has produced some striking results; in the field of education among others.

Read with this view of local history before the mind, the valuable essays which appear in this volume will have a new significance. We see once more at work the dogged resolution which maintained the independence of the old Ceredigion, engaged now in working out a system of educational facilities suitable to the needs of the district.

We see also the " grit of the Cardi " as shown in so many walks of life. The surplus sons and daughters aforetime went almost exclusively into the drapery or the milk trade, except for those sons who became ministers or clergymen. But the development of educational facilities has given a new trend to affairs. As teachers in elementary and secondary schools, the younger generation of Cardiganshire has made a place for itself throughout the kingdom. And as the milk-sellers and the drapers have by their thoroughness made their mark in those trades, so it is with the teachers. And whether teachers, milk-sellers, drapers or what-not, meet them where you will, however prosperous they may be, you will still find that their hearts remain true to their native county, and that they intend if possible to be at home in the summer to help with the harvest.

To assist the visitor to understand and appreciate the fine qualities of the people, and the interesting features of the district, is the aim of the writers who have generously contributed the articles in this book, to whom, as well as to those who have contributed the illustrations, the Press Committee offer their cordial thanks.

J. B.

THE PHYSICAL FEATURES OF CENTRAL WALES

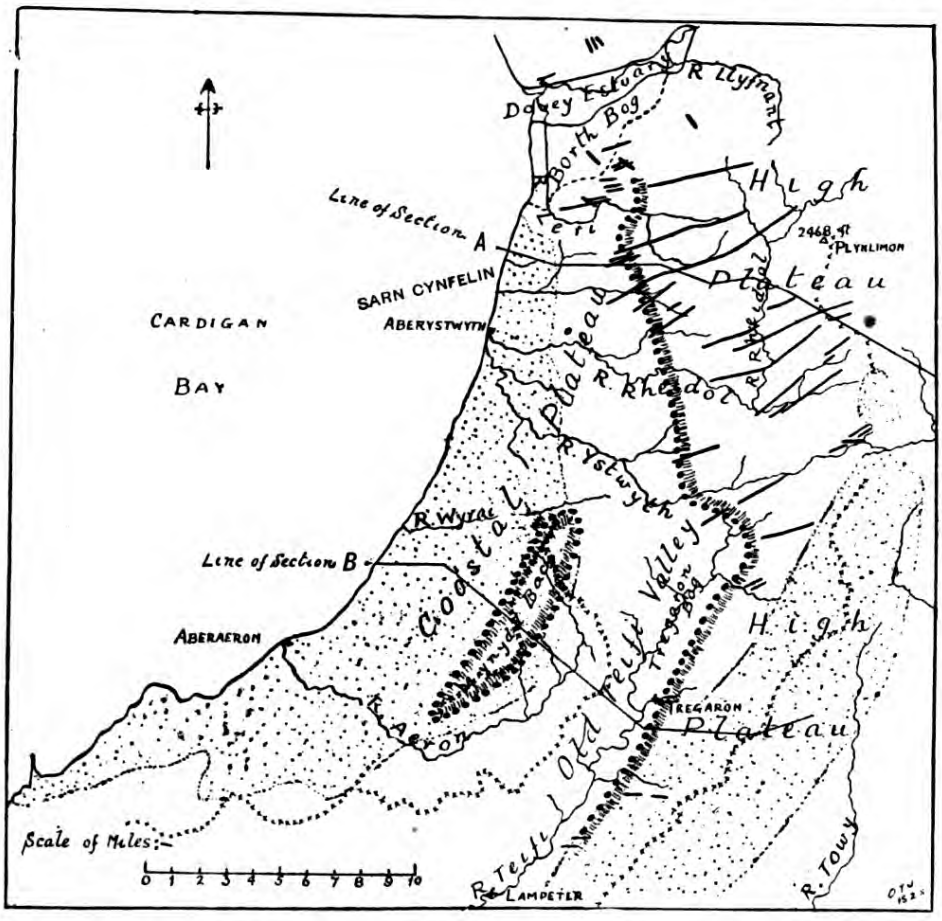
By O. T. JONES, M.A., D.Sc., F.G.S., Professor of Geology in the University College of Wales, Aberystwyth.

THE region known as Central Wales is not one that readily admits of exact delimitation, but for the purpose of this article the area bounded on the west by the coast of Cardigan Bay, on the east by a line drawn from Llanidloes through Rhayader and extending from north to south from Machynlleth to Lampeter may serve as a rough indication of the district dealt with.

It is proposed to give a brief survey of the chief physical features of this region with special reference to the manner and time of their origin, and it is hoped thereby to impress upon the reader the fact that what is known as the scenery of this or indeed of any region is the result of a long and often complicated series of changes: the various land-forms which make up the scenery being of divers origins and of very different ages.

If an observer posts himself on any elevated spot near the centre of the district defined above he will be faced in every direction by a magnificent panorama of hills and valleys bewildering in their arrangement and of infinite variety of form and magnitude, the whole suggesting to the mind an elaborate and fantastic piece of carving executed by a Titanic hand. The view is further diversified by small lakes and lakelets, which resemble tiny mirrors carelessly scattered about on the surface.

Further, the observer might perhaps notice that although the region is extremely uneven there is a general absence of any prominent peaks and ridges such as characterize true mountain regions. Most of the hills stand at so nearly the same height that if the district be imagined flooded with water most of the hill-tops would be submerged almost simultaneously, and therefore if the valleys and hollows were filled up the country would present the appearance of an immense level plain. This is, in fact, the most striking characteristic of the Central Welsh region and has an important bearing upon the question of the origin of its scenic features. In geo-



SKETCH-MAP OF CENTRAL WALES AND CARDIGAN BAY, SHOWING CHIEF PHYSICAL FEATURES.

Metalliferous veins shown by thick lines.

Dotted area represents approximately the outcrop of the Aberystwyth Grits.

graphical language the district may be described as an elevated plateau in which, subsequent to its formation, numerous valleys have been excavated, each bearing a relation to the size or power of the stream occupying it and by which it has been carved out. The level of the plateau declines gently from north to south, the average slope being about 1 in 250; the highest point is over 2,000 feet.

A belt of varying width adjacent to the coast of Cardigan Bay must be excluded from the *High Plateau* just described, for although it exhibits the plateau character to a greater degree of perfection, it stands uniformly at a lower level and slopes in a westerly direction; for these reasons it is evident that it has a different origin. At its inner margin it rises to about 900 feet and at its seaward limit it stands at about 500 feet. It is separated from the High Plateau by a fairly marked rise or shelf which, as will be shown later, probably marks the position of an ancient coast-line. This tract will be designated hereafter as the *Coastal Plateau* (*see* map and sections).

The Drainage Systems.—Broadly regarded, the drainage system of Central Wales, *i.e.*, the distribution and trend of the rivers, is arranged on a fairly simple plan. The main watershed lies for the greater part of its length on the High Plateau and ranges in a gently curved line almost exactly parallel to the present coast-line and about 15 miles distant therefrom. Accordingly the streams are thrown off on each side of this central axis, those flowing westward reaching Cardigan Bay, while those on the east ultimately reach at various points the Bristol Channel.

In addition to this set of streams there are others which pursue for a great part of their length a course nearly parallel to the coast and the main watershed; of these, the upper Aeron, the upper Rheidol, the Teifi and the Towy exhibit this feature very clearly. Generally

speaking the principal rivers belong to this set while the majority of the minor streams belong to the other.

Lakes.—In many of the river valleys, and in several places on the High Plateau lakes and lakelets of varying sizes and form and of divers origins are met with. It is unfortunate that these have as yet received but little attention, and no general rule can be given for their mode of occurrence and method of origin.

Peat Bogs.—In some parts of the district also there are deposits of peat, forming either flat boggy and marshy tracts of great extent (Tregaron and Borth Bogs), or covering large areas on the hill tops and hollows on the High Plateau. These have served for generations as a source of fuel to the inhabitants and with the progress of discoveries in the utilization of peat may, in the future, acquire greater economic importance.

Therefore the essential features of the region, the origin of which will be dealt with are : (1) The Plateaus ; (2) the drainage-systems ; (3) the lakes ; and (4) the peat deposits.

The Rocks of the District.—Before proceeding further it is desirable to introduce a brief description of the geology of the region, *i.e.*, the character and arrangement of the solid rocks, inasmuch as they have exerted an important influence upon the physical features. The rocks belong mainly to the systems known to geologists as the Ordovician and Silurian ; they consist of grits, flags, and shales, which may be grouped roughly into three sets, viz., a lower set of grits and shales found principally around Plynlimmon, a middle set of flags and soft shales, and a higher set of gritty strata of considerable thickness. The latter, (the *Aberystwyth Grits*) occur in two belts, one along the coast from Borth to Llangranog, and reaching its greatest width of about 8 miles between the Upper Aeron and the coast (*see* Map). The other forms a band following the High

Plateau from near Cwmystwyth southwards along the east side of the Teifi Valley, and having a maximum width of about 6 miles opposite Tregaron. As a rule the grits are harder and more resistant than the shales, and therefore tend to form higher ground, but many exceptions might be noted.

The Structure of the District or the Arrangement of the Rocks.—It is an accepted geological fact that all the rocks considered above were laid down in flat layers or beds on the bottom of a sea, but in course of time that arrangement was destroyed as a result of slow but important movements in the crust of the earth. The horizontal layers were thereby bent or folded into a series of great arches and troughs, or in geological language, anticlines and synclines ; the crests of the arches or anticlines were raised far above the level of the sea to form elevated mountain chains which in this district ranged approximately from north to south. The major folds or anticlines and synclines were themselves corrugated by numerous smaller folds having the same direction. During or after the folding, great fractures or *faults* as they are termed, were produced which ran as a rule in a west-south-westerly direction and becoming subsequently filled with mineral matter furnished the chief mineral wealth of the region.

Central Wales and its eastern border is traversed by two great anticlinal folds which trend in gently curved lines nearly parallel with the present coast. One of these nearly coincides with the Upper Rheidol Valley from Plynlimmon to Devil's Bridge, and is continued thence along the Teifi Valley, which it follows for about 30 miles, and thence probably ranges into Pembrokeshire. The other fold lies 15 or 20 miles to the eastward, and pursues a nearly parallel course, following the Towy Valley from Llandovery to Carmarthen and continued thence into Pembrokeshire. The course of

these great folds northwards, and their connection with the folds of North Wales have not been sufficiently investigated. It will be observed that each of these folds which was at one time the crest of a mountain range coincides for a great part of its course with a river valley; this apparent anomaly is even more strongly brought out by consideration of the syncline or trough which lies between the two anticlines and runs parallel with them. This fold coincides with the high ground which forms the principal watershed of Wales from North Cardiganshire into North Pembrokeshire so that the crests of the old mountains have become the valleys of to-day, and the ancient geological valley or trough now forms the main watershed of the country. There is thus an intimate relation between the present drainage system and the folding of the rocks, though it is the reverse of what one would expect.

In course of time the higher gritty strata forming the crests of the mountains were worn down, and the underlying softer strata were exposed, so that at present the lower beds occur along the anticlinal folds, and the higher strata in the intervening syncline. After the folding of the country a long period of denudation ensued in Wales, when the so-called Mesozoic rocks forming the eastern half of England were deposited, and it is likely that much of the material of these rocks was derived from the destruction of the then mountains of Wales. By the time that the chalk (the highest Mesozoic rock) came to be formed the relief of the Welsh land was probably very low, owing to the protracted spell of wear and tear by streams and by the sea around its margins. The chalk period indeed was one when the sea everywhere encroached upon the land, and it is probable that as a result the greater part of Central Wales became covered by the sea, and therefore deposits of some kind were laid down upon its surface. The

modern High Plateau thus appears to have formed the sea floor in the chalk period. The formation of the chalk was followed by an uplift of land during which the rocks of many areas were intensely folded. The Alps, Andes, and Himalayas are the products of this period of earth movement which, however, was only feebly felt in Britain ; one of its results was the uplift of the Welsh region above the level of the sea once more. The area thus upraised formed an immense plain which during the uplift had been given a gentle tilt in a southerly and easterly direction ; a small portion of it near the west was probably tilted in a westerly direction. On this plain, therefore, rivers began to flow towards the then sea in the direction of greatest slope, but it is not known exactly where the watershed lay, though it is considered probable that it coincided approximately with the main waterparting which to-day ranges in a north and south direction from Snowdonia through Merionethshire and thence along the High Plateau. It is possible, however, that it may have lain in some instances further to the west. On either of these suppositions there came into being a drainage system with rivers flowing in an easterly direction and others flowing westward into a sea area which lay perhaps even then somewhere on the site of the Irish Sea. Such a drainage system must have been unsymmetrical, for the easterly streams had long courses of gentle gradient, while the westerly ones had short steep courses. We may now proceed to trace the subsequent changes in this system.

All the rivers in the early stages were flowing over deposits of the chalk period which had but recently been formed at the bottom of the sea and therefore were in a loose and unconsolidated state. In a comparatively short time those surface deposits were cut through and then the streams had to deal with the underlying

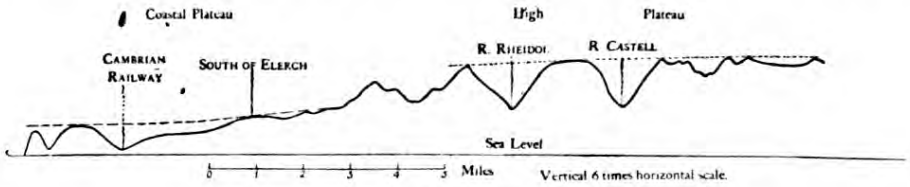
rocks which were considerably harder and the cutting down process was thereafter accomplished more slowly. The tributaries of the main streams flowed roughly in a northerly or southerly direction, and when the overlying deposits had been removed, they also had to cut their channels in the underlying strata. It is a well-known geological fact that the Mesozoic strata run across England in a general north-north-easterly direction, and form belts of alternately hard and soft rocks. Those tributaries, therefore, which happened to coincide with belts of soft rock were enabled to deepen their channel at a greater rate than those whose courses lay over more untractable strata and their valleys were enlarged more quickly. Along the soft belts there came into existence a veritable struggle for supremacy among the tributaries of the larger rivers—a struggle in which the victory was assured to that stream which initially possessed some advantage in power over its competitors, due perhaps to its having a greater volume or a steeper gradient. The result of a victory was the capture of part of the drainage of the weaker streams, and its diversion along the valley of the "pirate"; in time more and more of the weaker drainage system was captured until ultimately the main stream to which it was a tributary was tapped. Each victory increased the volume of the pirate stream, and in consequence its power, and the operation of capturing other tributaries lying along the same belt and of the main streams which crossed that belt became necessarily more easy.

We may now indicate briefly some of the results of this process as shown by the present rivers of Central Wales and contiguous parts of England. Those streams which flowed away to the east of the main watershed probably reached the region which is now occupied in part by the North Sea, while as suggested above, those on the west probably flowed into the Irish Sea

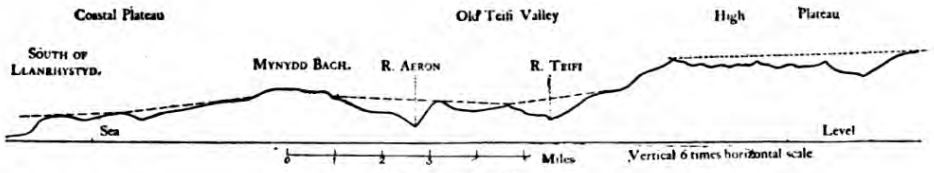
region. The majority of the Welsh rivers belonging to the former system are now tributaries of the Severn though as indicated above, they were once continued far beyond that valley, which has been excavated in a soft belt formed by the so-called Triassic rocks. The Severn therefore has probably played the part of a pirate stream in breaking up, by capture, the initial drainage system.

On the west side of the watershed this part appears to have been played by the Teifi. The lower course of that river, which trends nearly east and west, was one of the main streams on that side, but one of its tributaries from the north lay along the belt of soft shales, which had been exposed by former denudation along the crest of the main anticline of Central Wales, and thus captured the upper drainage of most of the westward-flowing streams, probably as far north as the neighbourhood of Plynlimmon, leaving only the lower portions of those streams to follow their initial courses. Further north the River Dyfi acted much the same part as the Teifi. The river system bore, therefore, a close similarity to the present one except that the upper Rheidol was continued southwards into the Teifi valley. It has been suggested that the main watershed lay at no great distance from the western sea of that period. Subsequently that coastline gradually advanced eastward by the erosion of the waves—a process which was probably helped by a slow subsidence of the land area. From these combined causes the line of cliffs steadily advanced, and the sea penetrated along the river valleys drowning them and converting them into broad estuaries. The chief line of attack was the Teifi valley, and along it the sea reached into the heart of the country, so that in time the coast lay far to the east of the present coast, but a long stretch in West Cardiganshire from Mynydd Bach to the south appears to have remained above the level of the

sea as a long island or chain of islands surrounded by steep cliffs (*see* Map). The drainage system of this western region then consisted of a short portion of the upper Rheidol, and short streams flowing down somewhat steep slopes into the sea along its eastern margin and around the Mynydd Bach Island. The position of that ancient coastline is roughly indicated at the present day by the shelf which divides the High Plateau from the Coastal Plateau (*see* Sects. A and B, below). The steady advance of the coastline eastward



SECTION A.



SECTION B.

Outline-sections, showing chief physical features of North Cardiganshire.

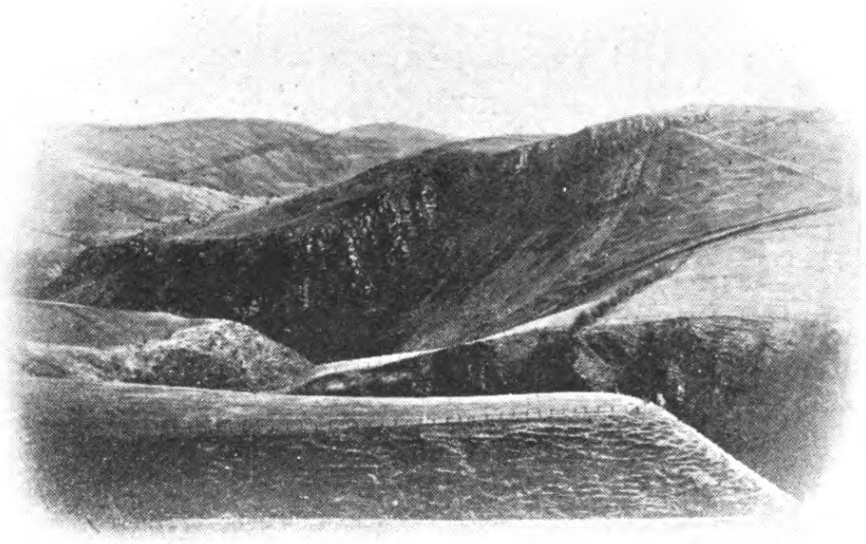
had, however, an important consequence, for it caused the gradients of the westerly streams to become steeper and therefore increased their power, with the result that they began to cut back their valleys at the heads and thus gradually shifted the watershed in the same direction. Thus it is that the streams which are tributary to the upper Rheidol on the west are shorter than those on the east. Moreover it is probable that one of the encroaching streams, forming what is now the lower Rheidol, actually cut its way into the old north and south (Rheidol —Teifi) valley near the Devils Bridge, and diverted that drainage into the western sea. About the same period, also, the north and south valley was further cut up near

Pontrhydygroes by the upper Ystwyth which worked its way along a line of weakness following a powerful fault. (*See* p. 44.)

When these changes had been completed there occurred the last movement of importance which has affected this part of Wales, viz. : a gradual uplift of the whole area, when the sea receded from the old line of cliffs exposing a flat surface covered with loose deposits ; the rivers gradually increased in length as the sea receded westward. The maximum extent of the uplift was probably about 900 feet, and after it was completed the coastline lay many miles to the west of its present position so that Cardigan Bay was not then in existence. The present Coastal Plateau is the remnant of that area exposed by the recession of the sea during this last uplift. When the period of movement was completed the sea began to attack the new land once more and Cardigan Bay began to be formed, its shape being determined mainly by the relative softness of the rocks in the centre of the bay, as compared with those of Pembrokeshire, and Carnarvonshire which form the horns of the bay. The rivers which flowed out over the upraised plain began to cut down channels for themselves but in proportion as the waves ate their way into the land at the coast the courses of these streams were shortened and their gradient increased, in consequence of which the cutting became increasingly vigorous. In this manner broad valleys were carved in the Coastal Plateau and those portions of their valleys which lay to the east of that Plateau became deepened. Thus arose that peculiar character of the Rheidol Valley above Devils Bridge where the present deep steep-sided gorge has been cut along the bottom of a broad valley with gentle sides and of much older date. (*See* p. 36.)

When this last uplift occurred the river Teifi naturally

followed the depression between the high hills which lay to the east of the ancient coastline and the Mynydd Bach Island (*see* Sect. B, p. 34) ; in fact it took up once more that course which had been drowned by the advance of the sea at a former time.



Valley of the Rheidol, south of Pont Erwyd, showing a recent steep-sided gorge cut into an old flat-bottomed valley.—*Photo, O. T. Jones.*

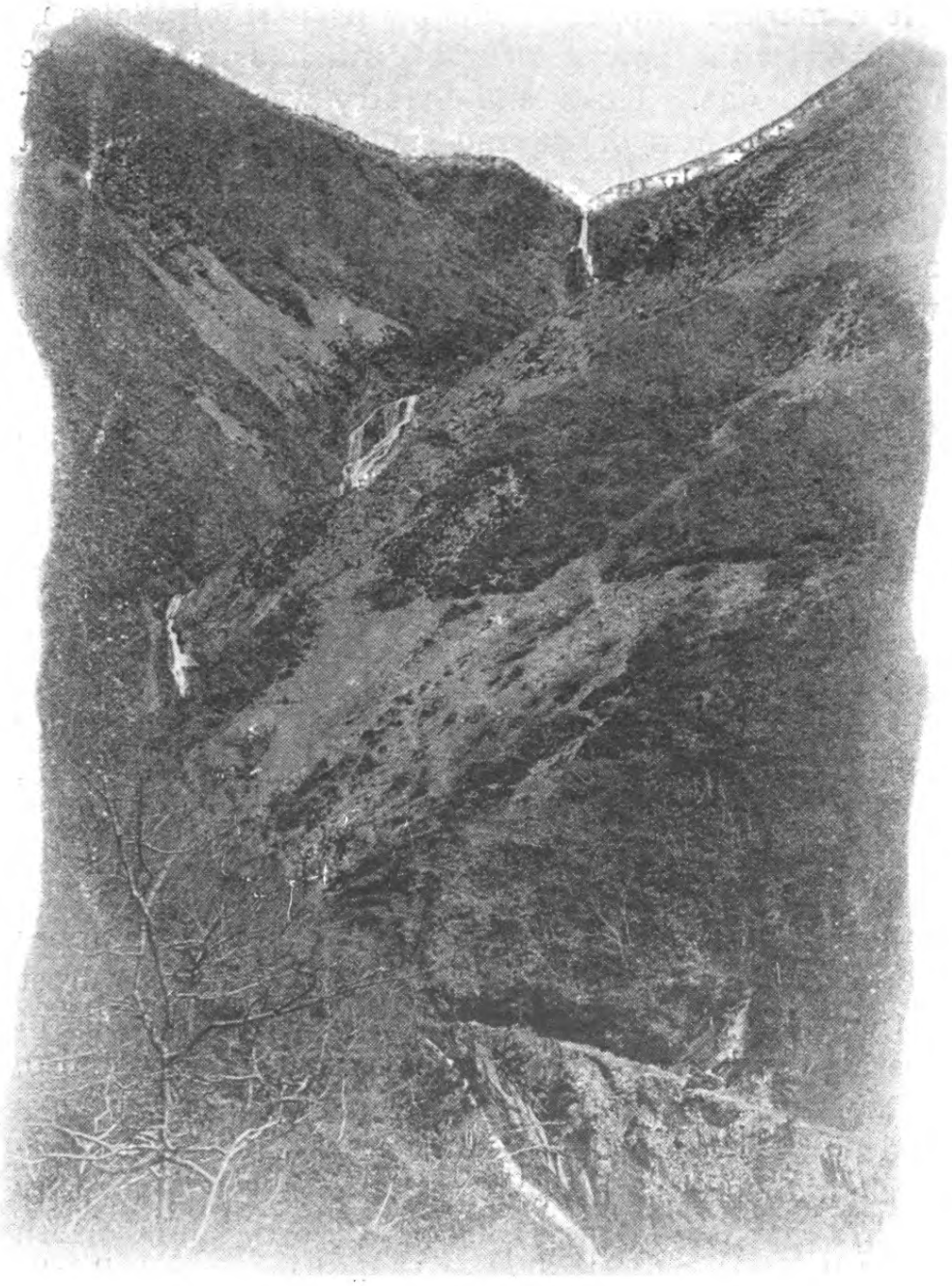
As a final result of the cutting-back of the cliffs of Cardigan Bay, captures of inland streams by coastal streams of increased gradient occurred. One of these is the lower Llyfnant, which intercepted a stream flowing northward into the Dyfi. Another, a tributary of the lower Rheidol, captured part of the drainage of the upper Rheidol to the north-west of Pont Erwyd. A very interesting case is that of the upper Aeron, which has intercepted a number of tributaries of the Teifi which fed that river from the direction of Mynydd Bach. The former courses of those tributaries beyond the Aeron Valley are indicated by distinct notches in the watershed

between the Aeron and the Teifi. There are probably other cases of a similar kind which have not been studied in detail.

Another and later episode in the earth's history has left a marked impression upon this part of Wales in common with the rest of the British Isles, viz., the Great Ice Age. The whole country was buried under a great thickness of ice and snow which moved in a general southerly direction down the Irish Sea and contiguous coasts, but in West Wales there was also a general movement of ice in a westerly direction from the main watershed. By the slow and irresistible movement across the country of this great mass of ice carrying rock fragments in its grip, the tops of the hills were smoothed and worn down and those valleys which lay in the direction of ice motion were altered in shape by the wearing down of the bottom and sides. From having a wide V shape they thus came to have the broad U shape so characteristic of most of the valleys having a westerly trend (*e.g.* the Clarach Valley).

Owing to the widening and deepening of the valleys by erosion, the tributary valleys were left at a higher level and their streams now cascade into the main stream. Such "hanging valleys" as they are called may be observed in many parts of Central Wales. In the later stages of the Glacial Period when the ice was receding the valleys were probably occupied by glaciers, their upper slopes being bare and exposed to weathering by frost action, from which has resulted the rugged character of the higher slopes of the valleys. In certain cases also, notably near Cader Idris and Plynlimmon, the valleys end in a precipitous rocky slope arranged in a semicircle like an amphitheatre; such a feature is known by such names as "cirque," "corrie," or by the Welsh word "cwm." At the foot of the hills a "corrie"-lake frequently occurs, which lies either in a basin scooped

out by ice erosion in the rock floor of the valley or it may be dammed up by material (moraine) left behind when the ice finally melted. The ice has left a characteristic



Hanging Tributary entering Rheidol Valley near Rheidol Falls.

impression upon the hill-tops also; in many parts of the district around Aberystwyth the low ridges on the higher ground have an unsymmetrical appearance, the side facing east being smooth and rounded; the side facing west being steeper and more rugged. This is a characteristic effect of ice erosion and indicates the direction of ice-flow, as the smooth side in all cases faces the direction from which the ice came, and the direction of the ridges lies approximately at right angles to the direction of flow.

In addition to the erosion effects, the Ice Age has left its mark upon the country in other ways. When the ice finally melted its load of material was dropped upon the surface in somewhat irregular hummocky mounds, known as glacial drift. Deposits of this type may be seen along the lower part of most of the river valleys, and in some cases have given rise to lakes which lie in hollows on the irregular surface of the drift. Occasionally former lakes of this kind have been filled up by a growth of peat-moss and other plants, and are now represented by peat flats. Near Tregaron a barrier of drift was left across the whole width of the Teifi valley and converted the low ground to the north into a lake which at one time was probably five or six miles long and two or three miles wide. The river flowed out over the barrier near its west end, and later cut down a narrow channel for itself and partially drained the lake; its position is now indicated by a peaty flat known as the Tregaron Bog, or Cors Caron, which for generations has supplied the inhabitants in the vicinity with peat-fuel. Glacial drift must have been deposited in large quantities also in Cardigan Bay and thereby converted a great part of the bay into dry land or marshes. On the seaward side of this low-lying tract there was probably a long barrier of shingle and gravel thrown up by storms; as this barrier gradually became shifted inland by successive storms the soft glacial deposits were worn away.

Along a great part of the coast they have been wholly removed, but in other places, especially to the south of Aberystwyth and near Aberaeron, the line of the old cliffs is still separated from the sea by a low stretch of glacial material which is being removed at a considerable rate; in time, when all will have been washed away, the coast-line will coincide once more with its position in pre-Glacial times.

It is this deposit of glacial drift in the river valleys that accounts for the difference between the coast-line of West Wales and parts of the country further south, such as South Pembrokeshire or Devon and Cornwall, where the sea penetrates far inland along the river valleys. Those parts of the British Isles escaped most of the effects of the glaciation and the valleys were not filled up with drift. If this deposit were removed from the Cardiganshire valleys the sea would penetrate inland as in the south of Britain. The drift in Cardigan Bay is probably responsible for those peculiar features the "Sarns," such as Sarn Cynfelin, Sarn Badrig and others which figure in Welsh legendary lore, where, however, an artificial origin is ascribed to them. It is likely also that the numerous specimens of rocks foreign to the district and even to Wales which are found along the beach at Aberystwyth have been washed up from drift lying outside in the bay. Many of these rocks seem to have been derived from the region of the Firth of Clyde, and hence have been carried hundreds of miles by ice.

The later events had comparatively little effect in modifying the features of the district. The mass of drift over Cardigan Bay was gradually washed away and the sea pushed ever nearer to the present coast-line; at the mouths of the principal rivers broad barriers of gravel and pebbles were thrown up by storms, forming "storm beaches." On account of the direction of the prevailing winds and the set of the tides from the south-west, these

are always higher and composed of larger boulders at their north end. Also, they opposed the passage of the streams into the sea, and these were forced to flow behind the barrier until they found an exit. This has happened in all cases at the north end of the barriers, and thus rivers such as the Ystwyth, Clarach and Leri debouched in this position even before artificial channels had been cut for them.

The storm beach which extended northwards for two or three miles from Borth separated off from the sea a wide expanse of low ground which came to form the marshy tract known as Borth Bog. On this marsh, which is occasionally flooded by the sea, a thick deposit of peat has accumulated, which, like that of Tregaron Bog, has furnished generations of inhabitants who live in its vicinity with fuel.

The surface of the country, which was bare after the recession of the ice, became clothed with vegetation, mainly of a herbaceous kind, while in the sheltered places, and especially the slopes of the valleys, trees of various kinds have grown. Thus, as time went on, the general aspect of the scenery presented a steadily increasing resemblance to that of the present day.

Metalliferous Mining

Historical.—Central Wales has long been celebrated for its mines of lead, copper, silver and zinc, though the value of the last-named metal has only been appreciated within recent years. The period at which the mines were first worked is entirely a matter of conjecture, for the first authentic account of mining operations refers to the reign of Henry VII. Systematic attempts to work the mines on a large scale dates from the time when Queen Elizabeth sent to Germany for experienced miners to explore the mineral districts of England and Wales. In

1568 a Corporation styled the Society of the Mines Royal was formed, which worked several of the Cardiganshire mines (Cwm Symlog, Goginan, Cwm Ystwyth, etc.) for some years.

The most prominent figure in connection with Cardiganshire mining was Sir Hugh Middleton, who rented the principal lead and silver mines from the Governor and Company of Mines Royal for £400 per annum. He made huge profits on the working of the mines, but he afterwards expended his fortune upon a scheme for bringing the New River from Ware to London in order to supply the capital with water. A few years later, owing to poverty, he was forced to work as a surveyor.

Following Sir Hugh Middleton came Mr. Thomas Bushell, who worked the mines for many years at a great profit, and in 1637 he established a silver mint at Aberystwyth ; from part of his profits he is said to have clothed the whole army of Charles I. during the Civil War.

The history of the industry records a tale of adventure and of fortunes made and lost in connection with it. A large number of mines which were actively working from half a century to a century ago are now lying idle, and the ruined buildings, derelict machinery and untidy spoil heaps impart a melancholy aspect to many parts of the country.

Geological.—The metalliferous area forms a roughly rectangular belt about 20 miles long and 4 miles broad extending in a south-south-easterly direction from near Aberdovey to beyond Cwm Ystwyth ; a few small mines lie outside this area, but the majority of the important ones lie within (*see* Map). The veins range with a considerable regularity in a west-south-westerly direction, though there are some important exceptions to this rule ; in general they are steeply inclined to the south The metallic contents of the veins bear

some reference to the nature of the surrounding "country" rock; hard grits such as those of Plynlimmon and the Tregaron hills being barren, as are also in general the soft-strata which extend from Pont Erwyd to the north of Plynlimmon. The veins are richest when traversing a pale greenish flaggy rock, and become poorer as the character of the rock changes to more shaly or more gritty varieties. Most of the important groups of mines, such as those around Talybont, Cwm Symlog, Goginan, Pont Erwyd and Cwm Ystwyth, lie either among, or in near association with, the pale flaggy rocks (*see* p. 46).

The filling of the veins consists principally of angular fragments of shaly rock formed by the grinding of the walls of the fissure during the progress of the faulting which produced them. With this is associated considerable quantities of quartz upon the character of which the miner bases his opinion of the promise of the vein; the opaque compact variety usually indicating a poor lode, while the well-crystallized varieties with large cavities ("rock crystal") are regarded as of good omen.

Of other non-metallic minerals *calc spar* (calcium carbonate, calcite) occurs in a few mines, especially those yielding copper ore; *heavy spar* (barium sulphate barytes) is found occasionally as near Llanidloes; *witherite* (barium carbonate) was found in large quantities in one mine and occurs also in a few others. *Fluor spar* (calcium fluoride), which is a frequent associate of lead ores in parts of England, has never been recorded.

Of the metalliferous minerals *galena* (lead sulphide) is the commonest and has been worked in most of the mines; it usually contains silver varying from small amounts to about 75 ozs. to the ton of lead. Galena is sometimes accompanied by *white lead ore* (lead

carbonate, cerussite) and *green lead ore* (lead phosphate, pyromorphite).

Black jack (zinc sulphide, blende) generally occurs with lead and in some mines is more abundant than the galena. It is now more sought after than formerly when the low price of zinc did not pay for the working of the mineral.

Calamine (zinc silicate) found in considerable quantities in one mine (Nant-y-Creiau) was at that time thrown away as a worthless " spar."

Copper pyrites in abundance occurs in some mines, as at Tre'rddol, Copper Hill (Cwm Ystwyth), and near Llanidloes and in smaller quantities elsewhere mixed with galena.

Iron pyrites (iron sulphide) found in considerable quantities in certain lodes (Comet lode at Cwm Ystwyth, Ystumtuen, etc.), is usually regarded as an undesirable constituent ; it is sometimes accompanied by *siderite* (ferrous carbonate spathie iron). A hydrated ore of manganese (Psilomelane) has been obtained in several places in the lode which crosses Drosgol hill west of Plynlimmon.

It has been observed that the richest bodies of ore are generally found at the junction of two or more veins or when a vein sends off branches or " shoots." Immense quantities of ore have been extracted from such situations at Cwm Ystwyth, Fron Goch, Esgair Mwyn and Goginan.

In some instances the veins have been dislocated by faulting of a later date than the filling of the veins ; these dislocations are generally small and unimportant, but at Cwm Ystwyth a powerful fracture cuts off completely the principal veins of that district. This fault follows the Ystwyth Valley for several miles and indeed has probably been the main cause which determined the formation of the upper part of that valley.

Geology of Central Wales

For the benefit of readers who may desire a more technical account of the geology of Central Wales, a brief description is appended of such districts as have been worked out in detail; fuller information may be obtained in the papers quoted below. Our knowledge of the rocks, and their fossils and of the geological structure of Central and West Wales is derived from a close study of four regions: viz., (1) the district east of Llanbrynmair,* (2) the district around Rhayader,† (3) the district around Plynlimmon and Pont Erwyd,‡ and (4) the district around Llansawel.§

The first district is situated near the northern margin of the region described as Central Wales, the second district is near the eastern margin, while the third is near the centre, and the last district lies to the south. Unfortunately, it was found advisable in each district to give local names to the various groups of rocks represented there, and hence the reader turning to these papers for information may be somewhat bewildered by the multiplicity of names for the same set of rocks. The table on p. 530 of the 3rd. paper above shows approximately what are the corresponding rock-groups in the first three of these districts. The rocks in the Llanbrynmair, and Pont Erwyd districts are very similar while those of Rhayader and Llansawel are somewhat different; their special peculiarities will be briefly referred to below.

Throughout Central Wales the upper Bala rocks, consisting of dark blue partially cleaved mudstones

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* E. M. R. Wood (Mrs. Shakespear), *Quarterly Journal Geological Society*, Vol. LXII, 1906, pp. 644–701.

† H. Lapworth, *Ibid.*, Vol. LVI, 1900, pp. 67–137.

‡ O. T. Jones, *Ibid.*, Vol. LXV, 1909, pp. 463–537.

§ Misses H. Drew and I. L. Slater, *Ibid.*, Vol. LXVI, 1910, pp. 402–419.

with bands of grit, are succeeded by the Llandovery or Valentian rocks, which show a definite sequence of dark shales with subordinate grits in the lower part, pale flags and mudstones in the centre, and blue mudstones with a considerable development of grits in the upper part; the rocks immediately underlying the Wenlock are purple and green mudstones. The Wenlock rocks consist of shales in the lower part followed by a great development of grits and shales known as the Denbighshire grits.

Most of the rocks contain fossils in abundance on certain horizons, but they consist almost wholly of graptolites, other organisms being as a rule extremely rare. By means of the graptolites the rocks have been minutely subdivided into *zones*, each zone being distinguished by the abundance of a certain species of graptolite which is rare or absent in the other zones, or by an assemblage of species different from the assemblage in other zones. The zone is generally called after the name of the abundant graptolite which is spoken of as the zone-fossil, *e.g.*, the zone of *Monograptus convolutus*. Where the succession is complete the following classification is applicable to the rocks found in Central Wales :—

Valentian or Llandovery-Tarannon.	Gala Stage or Upper Valentian	Upper Gala including the zones of *Monograptus crenulatus* and *M. griestonensis*. Mudstones and thick beds of grit.
		Lower Gala comprising the zones of *Monograptus crispus*, *M. turriculatus* and *Rastrites maximus*. Chiefly pale flags, shales and mudstones.

Valentian or Llandovery-Tarannon.	Birkhill Stage or Lower Valentian	Upper Birkhill with the zones of *Monograptus sedgwicki* and *Diplograptus* (*Cephalograptus*) *cometa*. Chiefly pale flags, but at Rhayader they have an important conglomerate (Caban conglomerate) at their base.
		Middle Birkhill with *Monograptus convolutus*, *M. argenteus* and *M. fimbriatus*. Pale flags with frequent bands of dark-blue shale, containing many graptolites.
		Lower Birkhill with the zones of *Monograptus cyphus*, *M. acinaces*, *M. atavus*, *Diplograptus modestus* and *D. acuminatus*. Shales and mudstones with thin sandy seams; at Rhayader, massive grits (Gwastaden grits) at base.
Upper Bala or Upper Hartfell	Plynlimmon Stage	Barren Beds. Mudstones with thick grits and conglomerate.
		Zone of *Dicellograptus anceps*. Blue flags and mudstones.

The Plynlimmon Stage is largely developed around Plynlimmon and probably covers a large area in North Cardiganshire, where it reaches a thickness of over 3,000 feet. It is found also south-east of Rhayader, and to the east of Llansawel. Fossils of the zone of *D. anceps*

were found near Nant y Moch, 5 miles north of Pont Erwyd.

The Lower Birkhill rocks occupy a considerable area around Pont Erwyd, and extend thence in two belts, one to the north-east towards Eisteddfa Gurig, and one to the north-west, which nearly reaches in that direction the hills flanking the estuary of the Dyfi: these rocks trend thereafter in a north-easterly direction towards Machynlleth. They occur in small faulted areas at Llanbrynmair and to the south. At Rhayader they form a narrow strip to the north-west of the prominent hill called Gwastaden, and at their base there are strong grits called after the name of that hill. Near Llansawel they cover a large tract of country, especially to the north and west of the village. Fossils (graptolites) may be obtained in most areas where these rocks occur; beautifully preserved graptolites were collected in the gorge of the Rheidol below Pont Erwyd.

The Middle Birkhill rocks are of small thickness and as a rule form a narrow belt succeeding the Lower Birkhill; they have not been recognized with certainty in the district around Llansawel. They have yielded graptolites near the Wye south of Rhayader, and near the Twymyn valley south of Llanbrynmair; especially well-preserved ones were obtained along the left (south-east) side of the Castell valley near Pont Erwyd, and elsewhere in that district.

The Upper Birkhill rocks also form a small group, except in the neighbourhood of Rhayader, where they attain great thickness and rest unconformably upon Lower and Middle Birkhill rocks, and have a remarkable conglomerate (Caban Conglomerate) at their base. Elsewhere they form narrow outcrops succeeding the Middle Birkhill. Fossils have been obtained in three of the above-named districts, but the subdivision has not been recognized at Llansawel.

The rocks of the Gala Stage have a larger share in the surface of Central Wales than any other, for they cover immense areas of country, by reason partly of their great aggregate thickness and also by reason of the repeated folding with which they have been affected. The Lower Gala rocks are generally pale and compact, and most of the mineral veins of Central Wales are in association with them; the Upper Gala rocks, on the other hand, are as a rule darker in colour and contain a

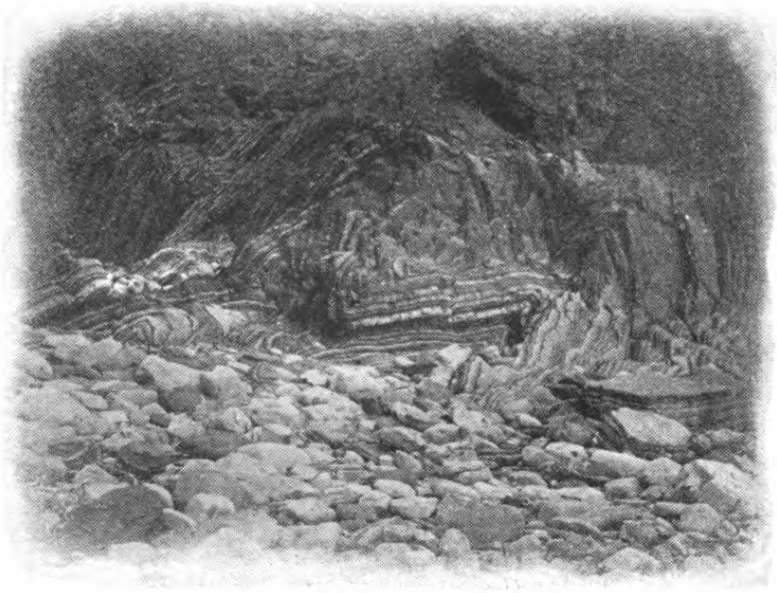
Anticline in massive Aberystwyth Grits near New Quay. Note erosion of waves along a fracture following the crest of the fold.—*Photo, Ernest Jones, Esq.*

great development of grits called by various names: Talerddig Grits, Aberystwyth Grits, etc. They are developed as the Talerddig Grits to the eastward of Llanbrynmair, and the similar rocks called the Aberystwyth Grits form two belts, one between the Teifi Valley and the coast, and extending from Borth to just south of Llangranog, the other forming the high ground between the Teifi and Towy valleys from near Cwm Ystwyth to Llanybyther Mountain (*see* above).

The highest Gala rocks (purple and green mudstones) are best known near Talerddig, where they have been called the Dolgau mudstones ; a small area of similar rocks occurs in the heart of the Tregaron hills east of Llanddewibrefi.

The Wenlock rocks are only developed along the eastern borders of Central Wales.

Structure of the district.—The greater part of Central Wales is traversed by folds, the axes of which range



Minor folding in Aberystwyth Grits near Tanybwlch.—*Photo, Ernest Jones, Esq.*

almost north and south. On a broad scale two principal anticlinal folds may be distinguished, coinciding roughly with the direction of the Lower Towy valley and with the Teifi and Upper Rheidol valleys. The district is traversed also by two principal synclinal folds, one trending along the high ground from the east of Plynlimmon along the Tregaron hills to Llanybyther Mountain. Each of these principal folds is made up of numerous smaller anticlines and synclines having the

same trend (*see* p. 50). The crests of these anticlinal folds are not in general horizontal like the crest of a house, but have a definite tilt or "pitch" as it is termed. In the Plynlimmon district the pitch is to the south but diminishes somewhat in that direction. To the north of the Plynlimmon district and around Machynlleth the pitch appears to be to the north. The folding of the district may therefore be compared to a corrugated sheet which has been tilted gently to the south in one part and to the north in another. The amount and direction of the pitch has a marked influence upon the outlines of the hills when viewed from east to west. The crests of the hills almost invariably slope in the direction of pitch; this is well shown to the south and west of Plynlimmon, while further south where the pitch is much less the hills are almost flat-topped. The district is traversed also by numerous faults ranging roughly to the west-south-west along which the principal metalliferous veins are found. In some cases, as along the Upper Ystwyth and Wyrai valleys, there appears to be evidence of powerful faulting of later date than that which gave rise to the metalliferous veins, for those veins are abruptly cut off by these faults.

The study of the glacial geology of the district has not proceeded far enough to enable one to enter into particulars.

THE HUMAN GEOGRAPHY OF CARDIGANSHIRE

By H. J. FLEURE, D.Sc., University College of Wales.

DURING the ice age, glaciers had been formed on the highlands of Wales and had spread down the Cardiganshire slopes westward to the coastal plain and the sea, depositing quantities of boulder clay on the lower land and scraping and rounding the smaller hills on their way. The lowland was not protected from the north whence a great sheet of ice from the Scotch Highlands spread down what is now the Irish Sea and across Anglesea. The mud brought down by the ice accumulated in what is now Cardigan Bay, though at that time the irregular heaping of mud may have converted that region into lowlying land with pools and marshes scattered about, and great beaches of pebbles sorted by the sea from the mass of ice-borne rubbish of which the land was built.

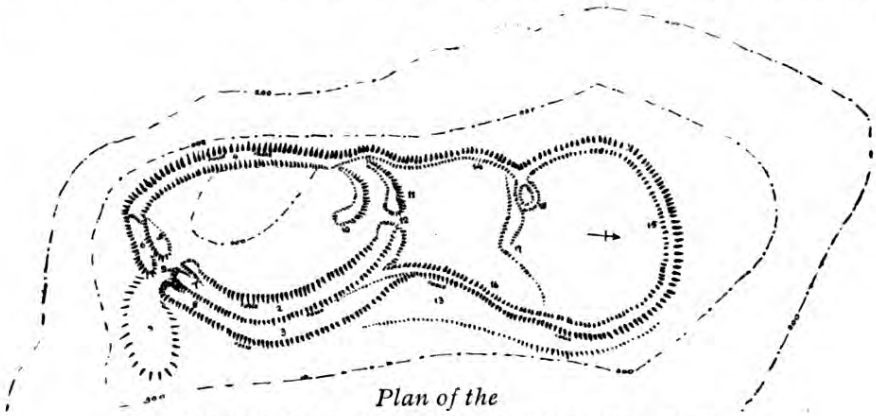
The disappearance of the ice left West Wales a cold damp country, with clay-floored hollows into the soil of which the water could not soak, while the irregularity due to the lumping of boulder clay here and there would hinder the establishment of a regular drainage. In course of time, therefore, the valleys became regions of bush and swamp, while the slopes somewhat higher up were suited to the growth of small oaks and other trees wherever there was sufficient shelter, and the hill tops were occupied by gorse and bracken or left with a covering of grass.

In the woodland lived the wild boar and the wolf, as well as smaller beasts of prey, and there would be hawks and eagles, falcons, buzzards and kites hunting in the hills. The amount of woodland no doubt kept the climate damp and the hollows with their swamps would be haunted by mists, breathing disease upon the early inhabitants, barely surviving in their bitter struggle with wild nature and a cold, moist climate.

The earliest inhabitants of Britain, the men of the age of rough stone, seem to have been hunters sheltering in caves and dug-outs, but of them no traces have been found in Cardiganshire. The local story must begin with an account of their successors, the rude herdsmen of the age of smooth-worked stone. They pastured sheep and cattle and, perhaps, later on, swine on the open hills and along the upper edge of the woods, with dogs to help them to defend the herds against the wolf packs and other beasts of prey which made the forest and the valleys the abode of mystery and danger. The hill tops and promontories were therefore the natural gathering places and centres of refuge, and earthworks were built not only to keep the wolves away but also to defend the flocks from neighbouring tribes, cattle stealing being no doubt a widespread habit amongst such folk. The coast-line of Cardiganshire at present shows few traces of promontory camps, perhaps they were on low capes since washed away by the sea, perhaps the coast was unsuitable, being for the most part without well-marked peninsular headlands.

Hill-top camps are a most characteristic feature of North Cardiganshire, and they almost invariably belong to the contour type, that is their defences almost follow the contour lines. Mr. F. S. Wright (U.C.W., Aberystwyth) has prepared a plan of Pen Dinas, one of the best of these fortresses of ancient times. It will be seen that the level of fortifications is somewhat above the 300 foot

contour to which it runs almost parallel. The summit is the strongest part, naturally, but the northern brow of the hill is protected as well and one is tempted to connect this with the possible occurrence of attacks from the sea, especially as the Aberystwyth beach is called Wig-y-Gwyddel. The rampart of the camp is built up by dry walling in some parts at least, but the writer has little doubt that some of the work is very ancient, and that there was a contour fortress here at a very early period.



Plan of the

PREHISTORIC EARTHWORKS ON PEN DINAS, ABERYSTWYTH.

1,2,3,4	Terraces (scarps)	13	Raised land on E. side.
5,6,7,8	Screens for protection of original entrance	14,15,16	Single rollum surrounding N. and middl portions.
9	Raised ground before old entrance.	17	Rise from S. to N.
9(a)	Original entrance to defences	18	Depression.
10,11,12	Screens for protecting inlet from N. portion of the camp.		

The greatest difficulty of life around and in these camps must have been the water supply, for, in several cases at least, there is no sign of a spring anywhere within the ramparts, though artificial ponds were probably made. Ways must therefore have been cleared down to the streams and occasionally the country lanes, which run straight down hill to a stream, are very deep cut between high hedge-banks which show their great antiquity, the ages during which men and cattle have trodden them down far below the level of the adjacent land. By

concentrating the herds and keeping watch over them it would be safe to lead them down to water, and the first impetus would be given to the work of clearing the lowland, the more favourable region where water abounded and storms were not so keen and strong.

With the extension of clearings and communications fortifications in some neighbourhoods were extended to form a chain of defence, as along the Wyre Valley, where a system of defences seems to centre round Caer Fawr above Trawscoed. The accompanying photograph was

N.W. Bastion, Caer Fawr, Trawscoed.

kindly presented by Mr. Ernest Jones, M.Sc. Of the age of these earthworks and of the deep lanes it is, however, difficult to speak with certainty, some are very old but have been made and remade and altered at various times, and many, notably some of the lanes, have remained in use. In some cases the lower and more sheltered camps, *e.g.*, Caer Argoed below Caer Fawr towards Llangwyryfon, show traces of huts, and may have been used as places of settlement when clearing had begun and the bleak exposure of the hill-top began

to tell against its obvious advantages for defence. But it was only slowly that the lowland was occupied, partly because of drainage difficulties, and the higher slopes were the first to come under cultivation in spite of the difficulty of ploughing them.

If, as has been hinted, Cardigan Bay was then a low stretch of land, perhaps with lakes and marshes, protected by a storm beach from the enroachments of the sea, its bare hillocks may have been the sites of human settlements and the well known legend of the Cantref-y-Gwaelod may be based upon the tragedy which washed this land and its villages away long ago.

It tells of a little kingdom protected against the sea by dykes, which were entrusted to the special care of Prince Seithenyn, who spent his time in drinking and revelling with his fellow watchers. So it happened that one spring tide, the south west wind grew strong and broke the dykes, and the great Atlantic waves rolled over the little kingdom and buried its city of Aberdyfi in their green depths. The fishermen fear the approach of death when they hear the bells of Aberdyfi toll in solemn measure as the ocean swell heaves through the sunken towers. It is impossible at this date to attempt to disentangle fact and fiction in this famous legend, but we may assume some foundation in fact, though it should be remembered that somewhat similar stories are found elsewhere on the coasts of Wales and Cornwall and Brittany.

Sir John Rhys has greatly helped the study of race questions by collecting the inferences which can be drawn from legend and fairy tale as to the life of prehistoric man. It imparts a greatly enhanced interest to these stories if they are looked upon as accounts of life in the far off past rather than as mere vain imagination, and we have in them a picture of the life of the Fairies or Little People, living in semi-underground

huts, knowing little about baking or the use of metal, and abhorring iron, but very wise in matters connected with cattle or herbs, and knowing the country minutely. They are dark and seem to age prematurely, and their language seems to later tribes an incomprehensible jumble of sounds. Edward Lhuyd, two hundred years ago, found that a few names here and there could not be referred to any form of Celtic speech and he inferred thence that there were pre-Celtic inhabitants of the country.

An anthropometrical survey of the Welsh people is in progress, and it is being found that one element in the population of every Welsh, and probably every British, district is a type with long oval head, the breadth about 75 per cent. of the greatest length, which is increased by a prominence called the occipital projection at the back of the head. This type has dark hair, dark eyes, and a comparatively slight build, and when quite pure the stature is perhaps rather below the average, the upper jaw projects slightly, the hair is black and the eyes dark brown. This type is best marked in the remoter districts such as the western valleys of the Plynlimmon range and the upper dales of Teifyside in Cardiganshire, among the Cærnarvonshire and Merionethshire mountains, and in the valleys of Cærmarthenshire and Glamorganshire where they would be somewhat cut off in old times by the lower Severn and Wye and the great forest of Dean. It is found in force in remote corners of England and France, and is the general type of the common people in the countries round the Mediterranean. It is thence called the Mediterranean type, and is supposed to have spread northward through Western Europe as the climate improved long after the Ice Age.

One characteristic of these people is that they erected rough stone monuments, the Menhir, Dolmen, and Cromlech, with meanings probably related to magic and

religion. The presence of those monuments near the Mediterranean, along the western shores of Europe, and in Britain is evidence in favour of the spread of a Mediterranean race to Britain. A good example of a Menhir can be seen at Bron Caradog, two miles from Llanafan, and a stone circle still survives just to the west of Parson's Bridge, while the churchyard wall at Yspytty Cynfyn contains great stones which were probably part of a larger one. Cromlechs are known to have existed in Llanddeiniol parish and at Blænporth until quite recently. Bedd Taliesin may be of later date, and some unexplored mounds or tumuli are also known. It is also possible that dolmens existed on the low promontories of the lost land in Cardigan Bay, such spots frequently chosen, *e.g.*, the promontories of Pembrokeshire, by the Mediterranean people.

To the same period may belong the hearths or cooking places, the remains of which are such a characteristic feature of the country. A trough was hollowed out in earth, lined with clay and filled from a spring, and stones heated on a fire above it were rolled down a slope to heat the water and so cook meat or other things placed in it. Heaps of charred and cracked stones would thus accumulate around a trough and it is these heaps that are now found. Ffos y-Bleiddiaid near Lledrod has some fine examples.

It is one of the great difficulties of anthropology that, neither on the physical side of research can one completely separate the elements in a long-mixed population, nor on the cultural side can one be certain of the relative ages of the various associations studied. Newer settlers mingled with the older inhabitants, especially in the open country, and they adopted many of the old customs and rites. These had become invested with mystery as they survived in the lonely remote corners of the land, under the care of the wise men of the old established

people who could utilise their traditional knowledge of the country to hurt, to bewilder and even sometimes, perhaps, to help the newer settlers.

The next question which crops up is as to what other elements there are in the population of Cardiganshire. There is, first of all, no doubt about the existence of a fair type of rather bulky build with strongly developed cheek bones and a head rather shorter, and therefore relatively broader, than that of the Mediterranean man. This type abounds in Cardiganshire along the coastal plain and especially the relatively open coast south of Llanrhystyd. The fair element stretches up the Wyre Valley and across the low hump of Mynydd Bach to Llangeitho, Llanddewi Brefi, Tregaron and Pontrhydfendigaid, and the evidence is as yet insufficient to settle the question whether these people penetrated the country from the coast inwards or from the Severn Valley westwards; probably both routes were used. Who then were the Celts or the bringers of the Celtic languages? The answer to this is that on the plains of England in pre-historic times the Mediterranean folk must have been subjugated by and must have mingled with invaders, probably the mixture of fair-haired northern folk and dark-haired broad-headed Central Europeans who had united with one another on the open plains of Germany and the Low Countries. These people seem to have developed the Celtic speech, in fact Continental anthropologists keep the name of Celt for the Central European people who came across the Balkans or South Russia, Hungary, the North Side of the Alps, and so westward into France and the Low Countries. Going westward, one finds more of the Northern and Mediterranean people and less of the Central European or Celt (of the Continental students), so that, perhaps, this latter type is rarest of all in Britain and especially in Wales, the Highlands, and Ireland.

Successive invaders pushed the older communities to some extent to the west, though there was, no doubt, much intermingling, and the mixtures further and further west would naturally contain larger proportions of the old Mediterranean element. The Celtic languages were passed on and superseded the ancient tongue, and it thus came about that the remoter, and therefore purer Mediterranean, communities used the older Goidelic branch of Celtic while the people in closer relation with what is now the English plain spoke Brythonic.

Ogam inscriptions have been found in South Cardiganshire and Pembrokeshire and in other parts of Wales, which are believed to show the Goidelic influence, and they are certainly found in regions where the Mediterranean element is very strong. Probably these communities learnt Goidelic and remained Mediterranean, with an admixture of warlords and princes of the fair type, as the tales of the Mabinogion tell us. An interesting group of fair-haired people, narrow-headed, and often tall and fine featured, occurs around Newcastle Emlyn, in the midst of a markedly Mediterranean population in one of the districts where the Goidelic language may have persisted for a long time ; it seems likely that these are the descendants of invaders from the sea, probably Norse folk, who had to fix and defend themselves there. Inquiry in the neighbourhood shows that they are still averse to intermarriage with the dark people, and, in some cases at least the offspring of intermarriage between dark and fair is the well known Cardiganshire red type so often found around Llanddewibrefi, Tregaron and Pontrhydfendigaid.

As regards the fair people of the open coast south of Llanrhystyd who are mentioned above, it may be stated that there is a certain amount of evidence for the belief that they came by sea. In Nennius there are references to settlements of Scots (from Ireland), in Dyfed, Gower,

and around Kidwelly, and words were borrowed from Ireland in the course of ancient trade, according to Professor Anwyl and others. The word Gwyddel, usually interpreted as Irishman, comes into several place names near the coast from the Dyfi down to Newquay, and the distribution of these place names is certainly remarkable for its correspondence with the distribution of the fair type in the central zone of the county, especially as we find, near Newquay, Cefn Gwyddel opposed to Lletty'r Cymro. This evidence from place names is collected together by Professor Anwyl in his "Early Man in Cardiganshire" in which article (*Archæologia Cambrensis*), the following are given :— Nant-y-Gwyddel and Waun-y-Gwyddel at Llanfihangel Geneu'rglyn, Gwern-y-Gwyddel at Tregaron, Pant-yr-Wyddeles in addition to those already mentioned near Newquay, Tref-y-Gwyddel, Llwyn-y-Gwyddel and Cwm-y-Gwyddel near Strata Florida, Hendref Goithel, mentioned in the Black Book of St. David's as being at Llanddewibrefi, Craig-y-Gwyddel in Cwm Wyre, and Wig-y-Gwyddel, a part of the Aberystwyth beach.

The same article also gives a list of the general archæological finds which have been made in the county, obviating the need for a repetition of them here. They are also dealt with in Rev. G. E. Evans' book on the Antiquities of Cardiganshire.

Other evidence for a line of demarcation of the fair people of the open coast south of Llanrhystyd is the fact that this village marks a distinct change of dialect from the supposed Powysian of North Cardiganshire to a form of the dialect of South Wales, and the line of the River Wyre which reaches the sea at Llanrhystyd is marked by a chain of earthworks indicating special need for defence. The frequent mention of intercourse between Wales and Ireland in the Mabinogion is some further support for the belief that part of the coastal

population may have come by sea, but this view must be put forward with some reserve pending more information about the people of Carnarvonshire and Anglesey and the Irish coast.

Leaving the still partly unsolved problem of racial analysis, we must now proceed to trace the progress of human settlement, especially in the Aberystwyth neighbourhood, which furnishes a specially interesting study.

As the hill slopes and low lands were cleared, the bleak hill tops seem to have been deserted in favour of other settlements providing shelter and a supply of fresh water, if these advantages could be gained without the drawback of dampness underfoot. The result was that a settlement was made at what is now Llanbadarnfawr, with a water supply from a tributary of the Rheidol and a fairly dry situation above the then tidal swamps which are now Plas Crug, North Parade, etc. The antiquity of this village is indicated by " Y Garreg Fawr," the remains of some ancient monument just beyond the church and a centre of such consequence that the butter market of the neighbourhood was held around it for generations. It was a settlement of such importance that the well-known late Celtic crosses discussed in another article were erected there and Padarn chose it as the centre from which his missionary efforts spread over the country.

The drier parts of the swamp below may have been used for pasturage. If danger appeared from high tides or enemies the cattle could be driven on to the adjacent hill which still keeps the name of Y Buarth Mawr.

Henry I. granted Cardiganshire to Gilbert Strongbow who secured his power by building two castles, one at the south end of the county (Cardigan) to defend the Teifi, and one at the north end, called Aberystwyth

Castle. This is described as being reached by going from Glas Crug beyond Ystrad Antaron (near Penparcau) and Mr. Evan Evans therefore believes it to have stood south-west of the Ystwyth river near where the river reaches the swamps ; the farm under shelter of a hill there is called " Tan-y-Castell," and there are earthworks on the hill. That castle was afterwards destroyed and another one, the one now in ruins, was built on the hill near the sea by Edward I. in 1277.

Meanwhile, fishing in the bay at the mouth of the rivers was of importance and fishermen's cottages were built in little lanes leading down to the water. Artificers and retainers must have also gathered round the castle which would thus protect what was by this time a fair sized village of fishermen and retainers. It was called Llanbadarn Gaerog, the fortified Llanbadarn, to distinguish it from the older Llanbadarn Fawr, and it was only later that the name of its Edwardian castle, probably inherited from that of Strongbow's castle, came to designate the town as well. A wall was built round the town enclosing the mound, the drier land above the surrounding swamp. When Aberystwyth grew as a market town, mining centre, and country port, and began to be a seaside resort as well, partly on account of its chalybeate springs (note the name Chalybeate Street) it became necessary to extend the town. The low-lying land outside was drained, while the walls were pulled down though their foundations still remain below ground. As there were of course no houses where the wall had stood, a ring of streets was made and we find Alfred Place and Baker Street, with the site of the Little Darkgate between them marking the transition from Little Darkgate Street (within the walls) to Portland Street (without), and the site of the Great Darkgate where Baker Street goes across to Chalybeate Street, marking the transition from the hill of Great Darkgate

Street (within) to North Parade (without). Chalybeate Street and Mill Street (the old name is Tan Dre—below the town) continue the line of the wall and then comes the position of the old gateway at the bridge, after which the wall went along South Road towards the castle. The wall had once been continued from Alfred Place round across Pier Street to the castle, but that part had disappeared before the rest was taken down. Historical details will be elaborated elsewhere, but the point made here is that the town of Lanbadarn Gaerog, now Aberystwyth, grew on and was limited by the margins of a hill mound between the sea and the tidal swamps towards Plascrug. Trefechan (the little town) with its characteristic narrow alleys of fishermen's cottages, grew at the same time on the south side of what was then perhaps only one of the channels by which the Rheidol reached the sea. That river seems to have had another line of exit along what is now Queen's Road towards the north end of the storm beach along which the northern part of the Promenade has been built.

The other coast towns of the county include Aberaeron, a bridge town with the advantage of an inland road up the Aeron valley into the centre of the county, and Cardigan, a bridge town at the upper limit of easy navigation of the Teifi, with a road along Teifyside meeting the coast road. Political considerations towards the end of the eighteenth century gave a well-known impetus to the foreign trade of Britain, and the Cardiganshire ports shared in the general activity, working also at the building and repairing of ships. With the advent of the iron ship and the steamer, and especially with the increase of draught of vessels, these small ports have decayed. The growth of railways has all but killed their import trade, but the old industry has had an important economic influence for the coastal towns and villages of Cardiganshire. Borth, Llanrhystyd, Llanon, Newquay,

Llangranog and St. Dogmael's (Pembrokeshire?) in addition to those already named, provide a large contingent of officers for the mercantile marine, and these officers usually keep their homes in their native place returning thither on retirement.

Inland, we find villages at road centres and around castles and early ecclesiastical settlements. Llanddewi Brefi, Pontrhydfendigaid and Newcastle Emlyn are examples of the latter types. Lampeter has grown in importance in the 19th century because of its central position and the gift of some Falcondale land for the building of St. David's College which, according to the original plans, was to have been placed at the historic centre of Llanddewi Brefi a few miles away. Most of these places, as also Llandyssul and Tregaron, are market centres. Llangeitho deserves special mention, it is the centre for the upper Aeron valley and is of interest as the charge of the famous vicar, Daniel Rowlands, whose religious zeal inaugurated the movement which has led to the foundation of the Calvinistic Methodist Church. Pencader (Carmarthenshire) has acquired importance as the junction of the Aberystwyth—Caermarthen and Caermarthen—Newcastle Emlyn railway lines. If a line should ever be built through the hill country of Central Wales, Pontrhydfendigaid might acquire some importance in the same way. Ystrad Meurig is interesting because of its famous endowed school where the classics are seriously taught to students, many of whom become clergymen.

The county as a whole will be treated mainly in the section relating to Physical Geography and Geology. Its boundaries on the north, west and east are unquestionably natural. To the north are Borth Bog (*Gors fochno*) and the sand and marshy stretches of the Dyfi estuary, a very effective barrier. To the west is the sea, and to the east the great bare hills of the

Plynlimmon range, and the latter has always provided a strong line of demarcation because of its unpopulated moorlands. On the south the Mynydd Prescely and their connections with the Plynlimmon range might be expected to be a line of demarcation, but the physical barrier is by no means so complete here as in the case of Plynlimmon. The result of this has been that the influence of the ancient town of Cærmarthen has spread up the southward looking valleys and across the hills, and the boundary now recognised is the River Teifi, a useful boundary for some though not for all practical purposes, but no such barrier to human intercourse as is provided by the other lines.

The rocks of the county are everywhere slates and grits which weather into flaky scree that forms poor soil. Large areas, including most of the more open country, are covered by boulder clay, the mixture of mud and boulders dragged along under a glacier or deposited as it melted, and derived in this case from the high lands of Mid Wales. Hollows in the boulder clay are often very damp because the clay is waterproof, Tregaron Bog, once a lake, being a notable example. These wet patches are of very little economic value, a certain amount of peat being almost the only product of any consequence.

In the valley bottoms the boulder clay or rock is sometimes covered by river-borne mud or loam which is generally fertile, though the fields influenced by the floodwaters of the Ystwyth, for example, have been poisoned by the lead the river receives as its tributaries drain from the settling pits of mines. The boulder clay can be cultivated, for though, especially the larger, stones are a nuisance to the farmer, the smaller ones assist him by keeping the texture of the clay somewhat loose. The county is notoriously deficient in lime, and in former times ships brought this material to all its

fishing ports and to many points on its beaches, as the numerous lime kilns attest.

Farming of a somewhat rough type is the characteristic industry of the county and is discussed in another article, stockraising being the most important branch of activity of the farmers, for Cardiganshire horses are in great demand. The higher lands are mainly sheep pasture, and some tracts are suitable for woodland which might probably be developed, though exposure to south-westerly winds raises some difficulties; the export of larch poles (for mine props) from the Rheidol Valley has been a noteworthy industry.

The wool of the sheep pastured in the county has long been used for spinning and the old spinning wheels were characteristic of country cottages before they were bought up by collectors of curios. The industry still persists and is fostered by the Welsh Industries Association, efforts being directed especially to overcome the uncertainties of the dyeing process when small quantities have to be dealt with in small country factories. The sites of these factories depend mainly on the waterpower available, but are at road centres if possible.

The mining industry is certainly a very ancient one. It is believed by some, largely on traditional grounds, that the Romans were attracted to Britain partly by rumours of its mineral wealth, and that their settlement in Wales was far more than a mere military occupation. The remains of Roman roads and the finds at Loventium (Pont Llanio) are adduced in this connection and it is certain that the veins of silver-bearing galena which abound in the region round Plynlimmon were worked in Roman-British times.

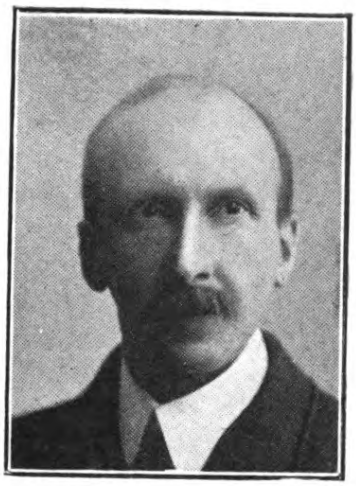
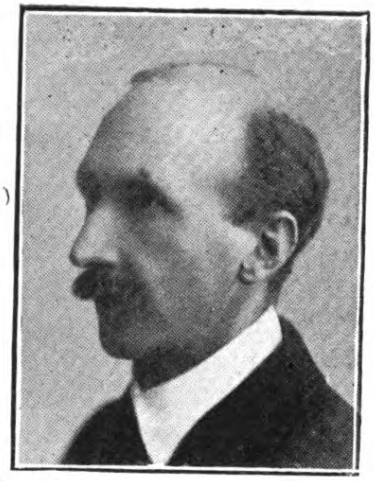
Of mediæval work we have no evidence, but in the seventeenth century Sir Hugh Myddleton obtained large sums from Cwm Symlog and spent the money

on his new river scheme. Towards the middle of the eighteenth century the industry decayed, but was revived in the nineteenth, largely through the enterprise of Mr. Lewis Pugh. The mines prospered, chief among them being Bwlch Esgair Hir, Goginan, Cwmsymlog, Darren, Cwmystwyth.

Aberystwyth was the natural port and centre for the mines, and it became equipped with foundry works when the industry was at its best. This led to the rise of a foreign (partly South American) trade in machinery for mines. When water transit grew more rapid and regular, and the industrial exploitation of foreign countries had progressed, it became cheaper to import galena from Spain and elsewhere. The mines have declined, though any rise in the price of lead brings hope back to the industry and the zinc blende is sometimes worth working, while the silver in the lead is by no means a negligible consideration. Perhaps with more complete geological knowledge the mines may regain some of their prosperity; a few are working now.

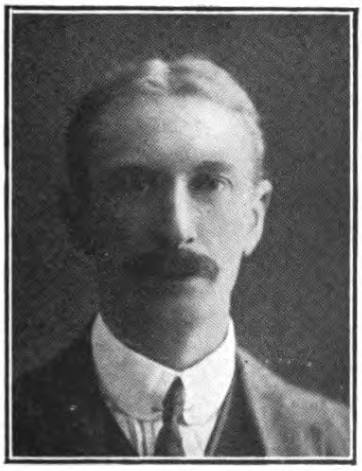
APPENDIX

THE views supported in the foregoing article with regard to the racial history of the Welsh people are based upon researches now in progress. Visits have been paid to numerous villages and towns in West Wales, and among the 1,500 persons observed in detail, 526 adult men have been able to trace their four grandparents to Cardiganshire, supposing this term to include both banks of the Teifi. These 526 may be taken as a fair sample of the population of the county outside such mixed centres as Aberystwyth. The most important measurements are those giving the relation of the maximum breadth to the maximum length of the head, and this relation is called the Cephulic Index. This index is nearly always between 70 and 85 for Welsh people, and the undoubted "Mediterranean" types are those with the index 70 to about 78, *i.e.*, with narrower

PROF. W. JENKYN JONES, M.A.

JENKIN JAMES, ESQ. M.A.



PROF. O. T. JONES, D.Sc., M.A.

heads, and dark pigments in hair and eyes. Of these, there were about 130 among the 526, and, of course, some Mediterranean characteristics are found among at least 90 more. The fair folk have the head index between 72 and 84, and there are well over 100 of them amongst the 526 samples. The individuals with distinctly red characteristics number about 40 out of the 526, and come mainly from the centre of the county. About 20 descriptive details and nearly the same number of measurements are taken for each person but it is not possible to deal with the more technical aspects of the work in a short article.

The following gentlemen have kindly consented to the publication of their photographs in connection with this article to illustrate three of the chief local racial types.

Professor W. Jenkyn Jones, M.A., is a Cardiganshire representative of the Mediterranean race. It may be added that Hwfa Mon and Gohebydd, among many others, belonged to this ancient stock.

Jenkin James, Esq., M.A., is a native of mid-Cardiganshire who belongs to the fair element discussed above for Mynydd Bach and the Wyre valley.

Professor O. T. Jones, M.A., D.Sc., comes from Newcastle Emlyn and represents the fair Norse element so characteristic of that locality.

H. J. F.

THE LAND FLORA OF CARDIGANSHIRE

By R. H. YAPP, M.A., F.L.S., Professor of Botany in the University College of Wales, Aberystwyth.

IT is not intended in this brief sketch to give a complete list of the wild plants of Cardiganshire, but rather to point out a few of the more important and striking features of the vegetation and the plants of which it is composed. In doing so, it will be convenient to consider firstly, some of the chief physical features presented by the county, and secondly, the distribution of the plants found in Cardiganshire : (*a*) in Great Britain in general ; and (*b*) in the county itself.

I.—PHYSICAL FEATURES

It is well known that, apart from the structural peculiarities and means of dispersal possessed by the plants themselves, the distribution of vegetation on the globe is to a large extent a question of climates and soils. Temperature, rainfall and atmospheric humidity, wind, the chemical and physical nature of the soil (including water-content) and other factors all play their part. It must also be remembered that climate, from a plant's point of view, is not something which is necessarily uniform over wide areas. Widespread climatic factors may and do stamp their impress on the general vegetation of a whole district, but in addition to this we find miniature climates operative over exceedingly limited areas. Thus, the sheltered, humid climate in which the

delicate, shade-loving undergrowth of a wood can flourish, is a very different thing to the climate endured by the dwarfed herbage which covers the exposed hill-side, only, it may be, a few feet distant.

Briefly, Cardiganshire possesses an exposed, wind-swept sea-board, with a hinterland which rises more or less gradually to an exposed, elevated plateau (1,300 to 1,800 feet above sea-level) intersected by numerous sheltered valleys. The highest point is Plynlimmon Fawr (2,468 feet) on the north-east border of the county. The climate in general is moist, the rainfall being fairly high, especially in the hill districts.* The rock and soil characters are remarkably uniform. Geologically, Cardiganshire consists almost entirely of grits and shales of the Ordovician and Silurian systems.† Limestone is practically absent from the entire county (even the boulder clay is non-calcareous): in consequence, plants which can only flourish on a calcareous soil are conspicuously lacking from the native flora.

II.—The Distribution of Cardiganshire Plants in Britain

The latest edition of the "London Catalogue of British Plants" contains a list of 2,047 species of flowering plants and ferns. Of these, some 810 have been recorded from Cardiganshire.‡ This number, will, no doubt be considerably increased when the local

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* The mean annual rainfall at Aberystwyth is about 33 inches. At Hafod, near Devil's Bridge, it is 54 inches, while the rainfall on Plynlimmon has been estimated (there is no station there) at from 80–100 inches.

† For particulars respecting the geology and physical geography of the district, the article by Professor O. T. Jones on pp. 25–51 should be consulted.

‡ Dr. J. H. Salter's list (*see* references at end) contains the names of about 700 species. Since this list was published, Dr. Salter has recorded more than 100 additional species.

representatives of such critical genera as Rubus, Rosa, Hieracium, etc., have been more completely studied.

Of the 2,047 species found in Britain, some are distributed (of course in suitable habitats) over nearly the whole of our islands, while others are confined to more or less circumscribed areas. H. C. Watson classified British flowering plants and ferns according to their distribution. The chief " types of distribution " which he recognised are :—(1) The *British,* comprising those plants which range over the major part of Great Britain. (2) The *English,* most abundant in the south, and tending to disappear towards the north, though some penetrate into Scotland. (3) The *Scottish,* which flourish especially in Scotland and the north of England. (4) The *Highland,* which form the alpine element of the British flora, and are practically confined to the more mountainous regions, especially in the Scottish Highlands. (5) The *Germanic,* whose home is in the eastern counties, and (6) the *Atlantic,* which for the most part are only to be found along our western borders.

An analysis of the Cardiganshire flora yields results that might on the whole be expected from the geographical position and topography of the county. The approximate number of species belonging to the main primary* types (excluding aliens and critical species) compared with the corresponding numbers in the whole British flora, are as follows :—

	British.	English.	Atlantic.	Scottish.	High-land.
In the Cardigan flora.	486	166	26	26	10
In the British flora.	532	409	70	81	120

* Intermediate types, such as " Atlantic-English " or " British-Scottish " are here classed as " Atlantic," " British," and so on, respectively.

Several Germanic species have recently been recorded for the county, but most of these have probably been introduced.

Expressing the above numbers as percentages of the respective totals we get approximately :—

	British. Per Cent.	English. Per Cent.	Atlantic. Per Cent.	Scottish. Per Cent.	Highland. Per Cent.
In the Cardigan flora.	60·0	20·5	3·2	3·2	1·2
In the British flora.	37·3	28·7	4·9	5·7	8·4

The proportion of plants belonging to the "British" type is very large, which means that the number of rarities found in Cardiganshire is comparatively small. Speaking broadly, the "British" plants are found generally distributed throughout the county. On the other hand, the majority of the "English" and "Atlantic" types occur in the lowlands (in the latter case often on the sea-coast) while the "Scottish" and "Highland" plants are largely confined to the more hilly parts of the county.

The following lists give a few examples of the Atlantic and other elements of the Cardiganshire flora :—

Atlantic	Scottish
Cotyledon Umbilicus	*Trollius europæus*
Sedum Forsterianum	*Viola lutea*
Crithmum maritimum	*Vicia Orobus*
Sibthorpia europæa	*Drosera anglica*
Euphorbia portlandica	*Antennaria dioica*
Rynchospora fusca	*Lobelia Dortmanna*
Hymenophyllum tunbridgense	*Empetrum nigrum*

Highland

Potentilla Crantzii
Saxifraga stellaris

HIGHLAND—*continued.*

Sedum roseum
Vaccinium Vitis-Idæa
Salix herbacea
Carex aquatilis
Lycopodium alpinum

The presence of the boreal types so far south as this is interesting, and is probably to be accounted for by the similarity of climate between the higher parts of the Cardiganshire plateau and the more northern mountain districts. Several of the Highland species (*e.g. Salix herbacea*, which was first discovered near the summit of Plynlimmon, by Dr. J. H. Salter, in September, 1905), have their extreme southern limit on Plynlimmon and the Brecon Beacons.

Sibthorpia europæa, on the other hand, which was first recorded for the county by Dr. Salter, in 1907, finds here the extreme northern limit of its range.

III.—THE VEGETATION OF CARDIGANSHIRE

Under this heading may be briefly considered a few of the more important plant associations or communities into which the vegetation of the county resolves itself. The general distribution of these is indicated on the accompanying sketch map (Fig. 1). They are :—

(1) The maritime associations of the sea-coast.

(2) The associations of the cultivated area, occupying (broadly speaking) the more westerly portions of the county, from sea level up to about 900–1,000 feet. (The extreme upper limit of cultivation in Cardiganshire is about 1,100 feet. In the Eastern Highlands of Scotland it is about 1,600 feet.)

(3) The peat bogs.

(4) The woodlands, which in the main are found on the hill sides, especially on the western slopes of the eastern plateau, and on the sides of many of the valleys which intersect it.

(5) The moorland- or hill-pastures, which form the chief vegetation of the elevated plateau above, say 1,000 feet.

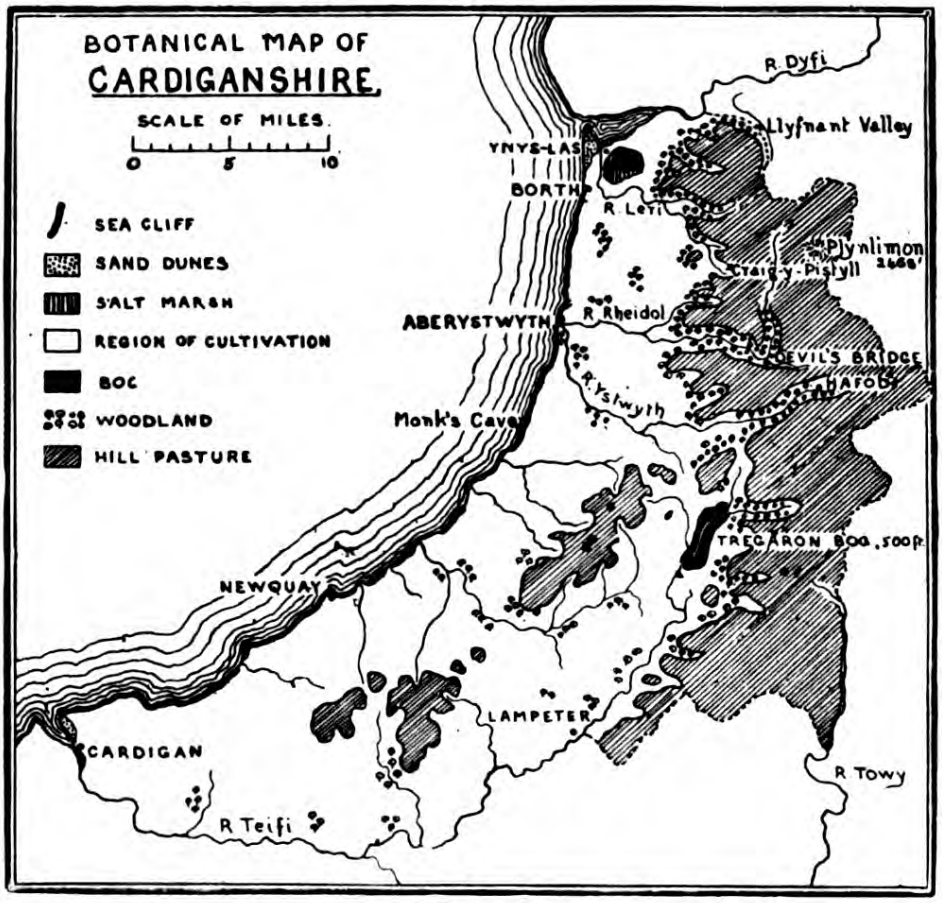

FIG. 1.

(1) *The Maritime Associations*

The Cardiganshire coast line consists for the most part of rocky cliffs, broken only by stretches of low-lying sandy, pebbly, or muddy shore, where the rivers join the sea (Fig. 1). Each variety of substratum has

its own characteristic species of plants, but all agree in one particular, *i.e.*, their capacity to endure the presence of considerable quantities of salt, whether in the water, soil or atmosphere. Such plants ("halophytes" or salt-loving plants) are very generally of a succulent, fleshy habit.

On the *rocky cliffs* are to be found the Sea Campion (*Silene maritima*†), the Sea Thrift (*Statice maritima*‡), the two "Atlantic" plants *Crithmum maritimum* (Samphire) and *Asplenium marinum* (Sea Spleenwort, at Monk's Cave and elsewhere), etc.

The *shingle beaches* produce, in addition to the Sea Campion and other plants, the yellow horned poppy (*Glaucium flavum*).

Sand dunes are infrequent, but are well developed at the northern and southern extremities of the county (at the mouths of the rivers Dyfi and Teifi respectively, *see* Fig. 1). Near Aberystwyth, a few sand plants can be seen to the south of the harbour, and there are also miniature dunes at Clarach. Amongst the characteristic plants are the Marram grass (*Ammophila arenaria*) and the two "Atlantic" spurges (*Euphorbia Paralias* and *E. portlandica*), etc. The growth-forms of dune plants are much the same all the world over, and they may be well studied on the sands at Ynys-las. The dunes themselves are to a large extent actually built by the agency of these sand-binding plants, which are characterised by the possession of roots or rhizomes of enormous length. They can also endure burial in the loose sand, their power of rapid upward growth quickly enabling them once more to rise above it.

Where the soil is muddy and liable to inundation by

† This extends inland for miles, on refuse heaps near lead mines, etc.

‡ Formerly known as *Armeria maritima*.

the sea, *salt marshes* are produced. A few of the commoner salt-marsh plants are : the Sea Plantain (*Plantago maritima*), Sea Rush (*Juncus maritimus*), Sea Aster (*Aster Tripolium*), etc. The Sea Lavenders (*Limonium*), which form such a marked feature of the salt marshes of Norfolk and elsewhere, appear to be quite absent here.

The effect of salinity, as mentioned above, is markedly felt by the coastal vegetation : the effect of wind, especially on tree life, is scarcely less so. Everywhere along the coast one meets with the characteristic dune-

FIG. 2.—Pebble ridge on the South Shore, Aberystwyth (October, 1910). In the foreground are two dwarfed, wind-swept sloe bushes (*Prunus spinosa*). The larger is of considerable age, probably not much less than a century old. The 1 ft. rule shows the height of the mat-like bushes. On the sheltered side of the ridge the shingle is largely covered by an inconspicuous encrusting lichen.

shaped, stunted Hawthorns, Sloes (*see* Fig. 2), and even Birches (Figs. 3 and 4) ; which have been permitted, by the prevalent S.W. winds, to develop their branches only on the leeward side.

(2) *The Region of Cultivation*

This is mainly situated in the western and southern portions of the county, and occupies most of the land between sea-level and an elevation of 900–1,000 feet. It contains a larger proportion of the weeds of cultivation than the other areas. Some of the old pastures, undisturbed by the plough for many years, contain such plants as the Frog Orchis (*Habenaria viridis*) and Adder's-tongue (*Ophioglossum vulgatum*). The woodlands are for the most part within this area, but it will be convenient to consider these separately.

(3) *The Peat Bogs*

The two chief bogs (Fig. 1) are those at Borth (very little above sea-level) and Tregaron (500 feet). These afford exceptionally fine examples of " high-moor " (or Sphagnum bog) vegetation, and are, from a botanical point of view, amongst the most interesting areas in the whole county. Tregaron Bog alone covers some 18,000 acres. The characteristic plants are the Cross-leaved Heather (*Erica Tetralix*), Ling (*Calluna vulgaris*), Andromeda (*A. Polifolia*), Cotton grasses (*Eriophorum*), Bog Myrtle (*Myrica Gale*), Bog Moss (*Sphagnum*), etc. Carnivorous plants are well represented : *e.g.* at Borth, the three Sundews occur (*Drosera rotundifolia, D. anglica,* and *D. longifolia*), as well as two Bladderworts (*Utricularia vulgaris* and *U. intermedia*) and the Butterwort (*Pinguicula vulgaris*). A feature of considerable interest is the fact that on the west and south, Borth Bog merges into a salt marsh. Where the two meet, the botanist can actually witness the silent struggle for mastery that is ever proceeding between the bog plants on the one hand and the salt-marsh plants on the other. Another point of special interest at Borth is an outcrop of rock which is to be found almost in the middle of the

bog. This rock (locally known as Llwyn-y-garreg) forms what is practically an island of dry land standing

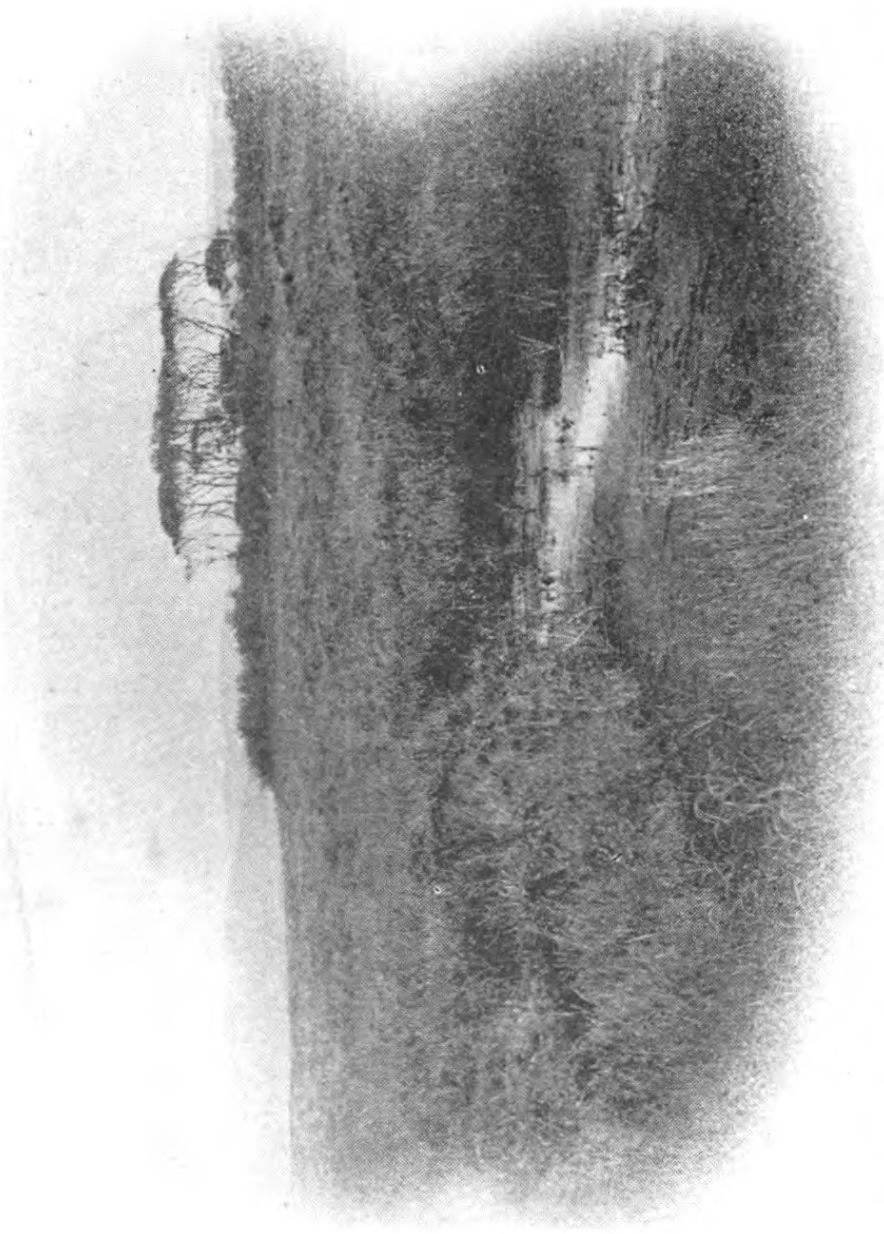

FIG. 3.—Looking eastward on Borth Bog (October, 1910), showing the outcrop of rock (Llwyn-y-garreg). The conspicuous plants here belong to the "birch-bracken" zone (*see* explanation of Fig. 4). The main bog vegetation is made up of *Calluna*, *Erica Tetralix*, *Eriophorum*, *Sphagnum*, &c. In the foreground is a damp spot with *Rynchospora fusca* and *Eriophorum angustifolium*. In the distance is seen the edge of the eastern *plateau*.

out conspicuously in the midst of a dreary waste of watery bog (Figs. 3 and 4). The "island" affords a

striking illustration of the effect of soil moisture in determining the distribution of plants. As the "island" rises higher and higher out of the bog, and the soil in consequence becomes drier and drier, different and distinct zones of vegetation succeed one another in regular order (*see* Fig. 4).

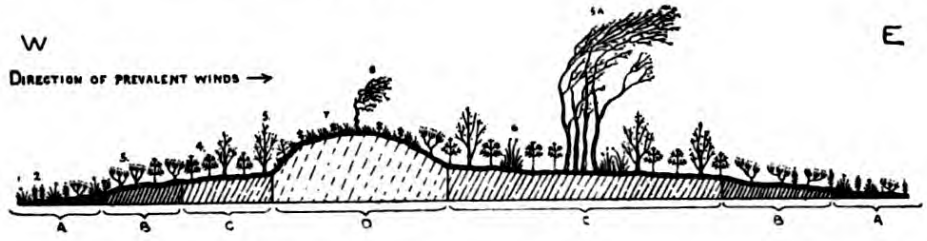

Fig. 4.—Borth Bog. Diagrammatic section across Llwyn-y-garreg. The vertical scale is three times the horizontal. The depth of shading of the soil indicates roughly the degree of dampness or dryness. The following zones of vegetation may be recognised :—

A. Bog Zone.—Wet peat soil. Chief plants: *Eriophorum vaginatum* (1), *Erica Tetralix* (2), a little stunted *Calluna vulgaris* (3).

B. Drier Bog Zone.—Soil of drier peat. Dominant plant is *Calluna*. *Myrica Gale* is frequent in some parts.

C. Birch-Bracken Zone.—Soil of shallower and still drier peat. The dominant plants are *Betula tomentosa* (5 and 5A—the latter are tall Birches, showing effect of wind) and *Pteris aquilina* (4). Here and there are patches of *Molinia caerulea* (6).

D. Dry Land Zone.—Soil dry and not peaty. Chief plants are Bluebells, grasses and Wood sage (7), with Sloe bushes and a few Hawthorns (8) and Oaks.

(4) *The Woodland Associations*

As stated above, these are best developed on the hill slopes, up to something like 800 to 1,000 feet. Towards the upper woodland limit, however, the trees become small and stunted. A good many woods have been planted (especially in the case of Larch, which is not a native British tree), but others are almost certainly primitive. Undoubtedly the natural woodland for the district is an Oak wood of a rather damp type, in which the sessile-fruited Oak (*Quercus sessiliflora*) is the dominant species (Fig. 5). This Oak is very characteristic of shallow, siliceous soils such as occur on the hill slopes of Cardiganshire, just as *Quercus Robur* is characteristic of deeper, richer soils. The trees in the Cardiganshire

Oak woods rarely grow to a large size, coppicing being largely resorted to. Interspersed with the Oaks are Birch trees (*Betula tomentosa*), and occasional Ash, Mountain Ash, etc.

The ground flora varies in different woods. Where the soil is deep and rich, Primroses and Bluebells are abundant. These, however, are for the most part absent on the shallow soils of the upland Oak woods. Here the

FIG. 5.—*Quercus sessiliflora* wood in valley at Parson's Bridge (N. of Devil's Bridge.) A few Birches are to be seen in the wood. On the left is a rocky slope with Ling and Bracken. In the background (above the tree-limit) are the higher hill slopes with moorland pastures. Several dark patches of Bracken may be seen on the hill sides well above the tree-limit. October, 1910.

soil is often peaty, and heath plants may occur in the undergrowth. In these woods the dominant ground plants are Mosses (*Sphagnum*, etc.). Ferns, the Bilberry (*Vaccinium Myrtillus*), Wood Sage (*Teucrium Scorodonia*) and other plants are also abundant, while Ling may occur in the better lighted spots. Mr. Tansley informs me that Oak woods of an almost exactly similar type occur (also on Ordovician rocks) at Glendalough, in the south of Co. Wicklow.

On the sea-shore at Borth are the remains of a now submerged forest, lying between tide marks. This

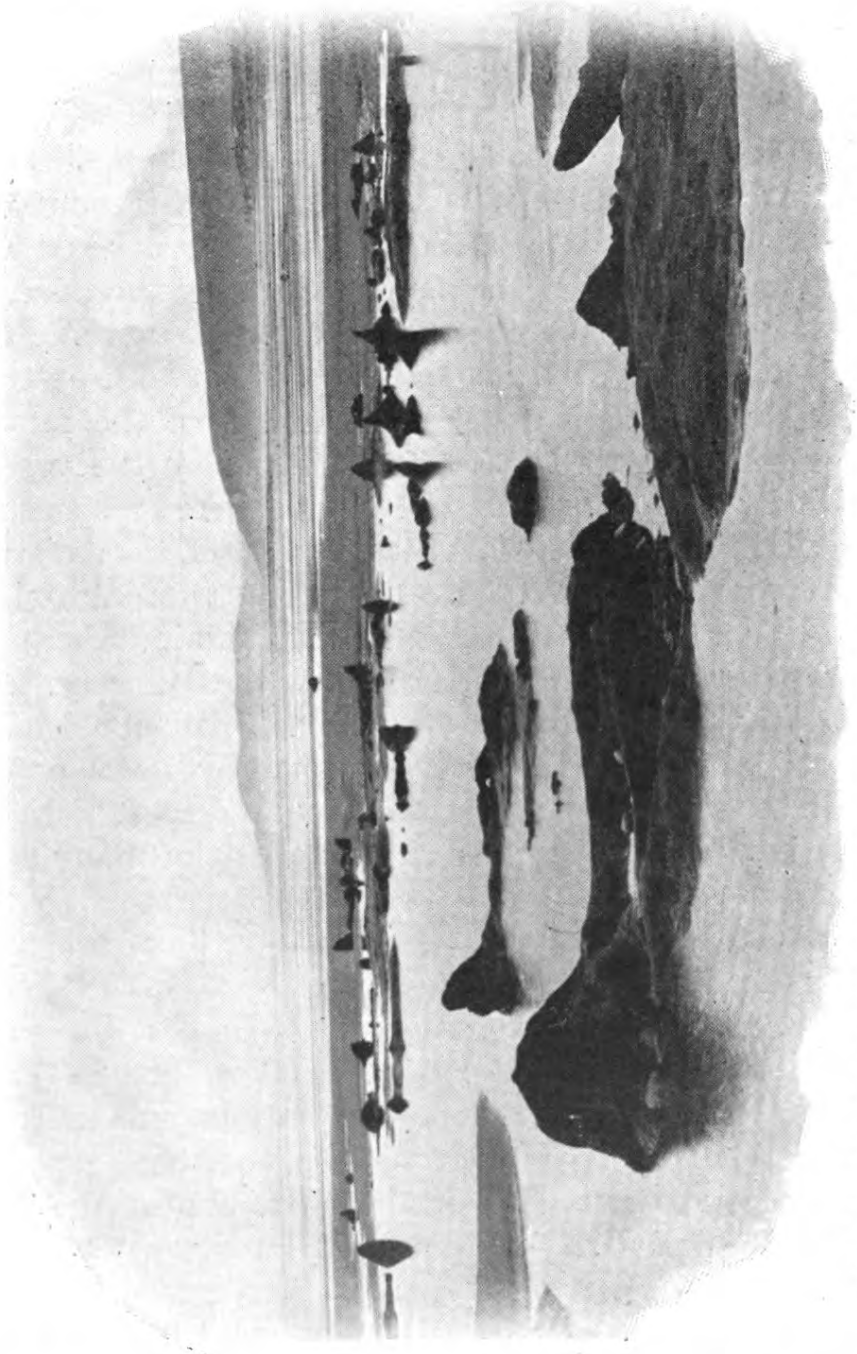

FIG. 6.—Submerged Forest on the sea-shore at Borth, showing old tree stumps, etc.—*Photo, W. R. Hall.*

forest, like similar ones found on various parts of the

British coasts (*e.g.* Pembrokeshire, Cheshire, etc.), probably flourished in post-glacial times. The present aspect of this submerged forest is seen in the photograph forming Fig. 6.

(5) *The Moorland- or Hill-pastures*

Above the tree limit, the exposed elevated region which occupies the whole of the east of the county, as well as portions to the south, is practically covered with dwarf herbage, which has been much less modified by human influence than is the case in the other areas. From an agricultural point of view, these moorland-pastures are important in that they form part of the famous sheep-grazing tracts of Wales. Even here the vegetation is by no means uniform, but varies in response to even slight changes in the nature of the soil, the moisture, the degree of exposure, and so on. Thus miniature bogs are formed in the damper hollows. Again, where the soil contains an admixture of peat, the Bilberry, Ling and other peat-loving plants occur. Although Ling is not an infrequent plant, it is generally more or less stunted, and nowhere in Cardiganshire does it form the extensive heather-moors so characteristic of many other parts of the country. In addition to those already mentioned, the following are amongst the commoner plants of the moorland-pastures : *Festuca ovina* (Sheep's Fescue), *Nardus stricta* (Matweed), *Juncus squarrosus* (Heath Rush), *Empetrum nigrum* (Crowberry). Three species of *Lycopodium* are also not uncommon (from 1,500–2,460 feet). These bleak hill-pastures are enlivened by few conspicuous flowers, almost the only ones being *Viola lutea* (Mountain Pansy, up to 1,640 feet), *Potentilla erecta* (Tormentil, found from sea-level up to almost the summit of Plynlimmon), and *Scabiosa succisa* (Devil's bit Scabious. This reaches a height of 1,640 feet).

Above the tree limit, the Bracken (*Pteris aquilina*) forms a conspicuous feature of the vegetation, often appearing in large patches on the hill sides, up to about 1,270 feet (*see* Fig. 5). According to Burkill and Willis, the extreme upper limit of the Bracken is 1,500 feet in Cardiganshire, though, curiously enough, in the Eastern Highlands it ascends to a height of 1,900 feet.

Cryptogamic Flora

As might be expected from its climate, the flora of Cardiganshire is especially rich in Mosses, Liverworts and Ferns. The dominant ground flora of the Oak woods (as mentioned above) consists of Mosses, while other species of the latter are abundant on the bogs and elsewhere. In 1906 the Rev. W. Hunt Painter published a list of the Mosses and Hepatics of Cardiganshire, which included about 165 species or varieties of the former, and 57 of the latter.*

Interesting Botanical Localities

For the convenience of those unacquainted with the county, a few of the more interesting spots (*see* Fig. 1) may be enumerated :—

Maritime plants.—The neighbourhood of Monk's Cave possesses a good rock flora. Ynys-las is a good centre from which to reach the special floras of the sand dunes and salt marshes. A number of interesting halophytes occur on the shore to the south of the harbour at Aberystwyth.

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* Mr. Painter had been subsequently engaged in further investigations on the Cardiganshire Mosses, but unfortunately a severe illness, which terminated fatally in October, 1910, prevented the completion of this useful work. Before his death, Mr. Painter presented his large and valuable Herbarium to the University College of Wales, Aberystwyth.

Bogs.—Ynys-las station is most convenient for Borth Bog, and Tregaron for Tregaron Bog.

Woodlands. — Near Aberystwyth are Cwm Woods (largely planted, and mixed as regards the trees) and Nant Eos Woods. Typical *Quercus sessiliflora* woods are well developed along the Rheidol valley, and may be reached from Nantyronen or Devil's Bridge or other stations. Llyfnant valley is another good spot.

Hill-pastures are conveniently reached from the Devil's Bridge station. The higher parts, especially round Plynlimmon, possess a very interesting group of plants.

Craig-y-Pistyll is also interesting botanically. On the rocks here occur the rare *Sedum Forsterianum*, etc.

References, Etc.

I am indebted to several of my colleagues and students for help on several points connected with the preparation of this sketch of the Land-flora of Cardiganshire ; and particularly to my friend Dr. J. H. Salter, who has kindly placed a number of his MS. notes at my disposal. Use has also been made of information contained in the following works, which may be consulted by those desiring further information :—

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THE MAMMALS, BIRDS, AND BUTTERFLIES OF NORTH CARDIGANSHIRE

By J. H. SALTER, D.Sc.

THE local fauna being closely influenced by the natural features of the district, a few remarks may be made under this heading. The general bareness of the country is evident, there being but little timber of any size except in private grounds, as at Gogerddan, Nanteos and Hafod. Larch plantations are, however, numerous, and there is much oak-scrub on the slopes, as seen in ascending the Rheidol valley to Devil's Bridge. There are no lakes, with the exception of the llyns, or pools in the hills. The rivers are swift mountain streams with no sheltering margin of reeds or sedge, and are, moreover, in some cases fouled by lead-washings. A rock-bound coast, except for the one break of the Dovey estuary, holds out no attraction to wild fowl or wading-birds. Cardiganshire lies far back in the bay, contrasting in this respect with Pembrokeshire, whose islands and far-stretching headlands naturally intercept many birds as they pass up and down St. George's Channel. Inland the country is everywhere cut off from the rest of Wales by a wide stretch of bleak uplands, except on the north where the Cader Idris range forms a still higher barrier. The Plynlimmon range and its southern extension, forming the backbone of Wales, might be expected to exclude some of the more delicate warblers from entering Cardiganshire. This appears to be the case as regards

the Lesser Whitethroat and Wryneck, while some resident birds, as the Nuthatch (and probably the Hawfinch), only occur very exceptionally upon the western side of the mountains.

MAMMALS

Since the extinction within historic times of the Brown Bear, Wolf, Wild Boar, Red Deer, Wild Cat and Beaver, these are now chiefly represented by small and widely-diffused species. I do not know of any Cardiganshire specimen of the Marten, though examples have been obtained within recent years on the Cader Idris range. Of Bats, the Pipistrelle, Long-eared Bat and Noctule occur, and a colony of Natterer's Bat has been found frequenting the tower of Llangorwen Church. The Hedge-hog is, of course, abundant, also the Common Shrew. The Water Shrew has been met with, and no doubt careful search would add the Pygmy Shrew to the list. It need scarcely be said that the Mole is everywhere in evidence. Of Rodents we have the Squirrel, Dormouse, Water Vole, Field Vole (the familiar " Short-tailed Field Mouse "), the Brown Rat, House Mouse, Long-tailed Field Mouse, Common Hare and Rabbit, while a good observer would no doubt detect, in addition, the Bank Vole. The Fox is hunted so far as the difficult nature of the country allows. The Weasel and Stoat are, of course, numerous, and the Polecat, elsewhere almost exterminated in Great Britain, is still far from uncommon in the neighbourhood of Aberystwyth. The Badger, though little seen, still exists in fair numbers, and the Otter is hunted in the clearer streams as the Leri, Aeron and Teifi. The Common Seal is frequent, especially in the neighbourhood of the Monk's Cave, where also the large Grey Seal sometimes occurs. Of the Cetacea, the smaller Whales, Dolphins, Porpoises, we cannot speak with certainty.

Local Variety of Pole Cats

The Pole Cat is still not uncommon in Cardiganshire where the great areas of boggy land would seem to favour it. Mr. Forrest ("Vertebrate Fauna of North Wales") notes that two examples of a curious variety were obtained there in 1902–3; they were of an uniform light-brown colour, and lacked the usual facial markings. Mr. T. Hutchings, of Aberystwyth, states that a litter of pole cats, all of this light variety, was sent up to him from

Pole Cat.—Local light-coloured variety.

Tregaron in 1907. Since then he has heard of one light-coloured pole cat from near Gogerddan and of another at Penllwyn. He has bred pole cats with ferrets, but has never produced this light-coloured variety, so there is no evidence for considering it a hybrid. The localities from which specimens have come preclude, one would think, the hypothesis of its being due to a single sport. The origin of the variety is thus a mystery, but it is interesting to note that all the animals in a litter belonged to it, as this shows the light colour to be an innate character of some stability.

Birds

The birds occurring in this or in any other given district may be conveniently classified as follows :—

(1) *Residents.*—These are to be met with in the district throughout the year, and breed there.

(2) *Summer Visitors.*—These arrive from the South in the spring and, after breeding with us, retire in the late summer or early autumn.

(3) *Winter Visitors.*—Arrive from the North in autumn, and, after wintering with us, leave upon the return of milder weather.

(4) *Passing Migrants.*—Appear for a short time when on passage, usually about May and again in August or September, but do not stay to breed.

(5) *Casuals.*—Birds of rare or quite uncertain appearance.

Residents.—These number about eighty species, as follows: Missel Thrush, Song Thrush, Blackbird, Stonechat, Redbreast, Goldcrest, Hedge Sparrow, Dipper or Water Ouzel, Long-tailed Tit, Great Tit, Coal Tit, Blue Tit, Marsh Tit, Wren, Tree Creeper, Pied Wagtail, Grey Wagtail, Meadow Pipit, Rock Pipit, Greenfinch, Hawfinch, Goldfinch, House Sparrow, Chaffinch, Linnet, Lesser Redpoll, Bullfinch, Corn Bunting, Yellow Bunting, Cirl Bunting, Reed Bunting, Starling, Chough, Jay, Magpie, Jackdaw, Raven, Carrion Crow, Rook, Skylark, Woodlark, Green Woodpecker, Greater Spotted Woodpecker, Lesser Spotted Woodpecker, Kingfisher, Barn Owl, Long-eared Owl, Tawny Owl, Common Buzzard, Sparrow Hawk, Kite, Peregrine Falcon, Merlin, Kestrel, Common Cormorant, Heron, Common Sheldrake, Wild Duck or Mallard, Teal, Ring Dove or Wood Pigeon, Stock Dove, Red Grouse, Pheasant, Common Partridge, Water Rail, Moorhen, Coot, Ringed Plover, Golden Plover, Lapwing, Oystercatcher, Common Snipe, Dunlin, Curlew, Black-headed Gull, Herring Gull, Lesser Black-backed Gull, Great Black-backed Gull, Kittiwake, Razorbill, Common Guillemot, Puffin, Little Grebe or Dabchick, Manx Shearwater.

A few of the birds in this list do not breed within our

limits, but their nesting-haunts are so near at hand that they are constantly to be met with in the district, and thus may fairly be classed as residents. Such are the Kite, Great Black-backed Gull, Kittiwake, Puffin and Manx Shearwater. The House Sparrow is scarce in the hill-district. The Cirl Bunting, never numerous, appears to have decreased within the past ten years. Only a pair or two of Choughs is now to be found breeding upon this stretch of coast. Many Curlew, a few Golden Plover and a limited number of Red Grouse nest upon the moors, bogs and sheep-walks of the Plynlimmon Range, while Wild Duck, Teal and Dunlin breed round the margins of the llyns. Ringed Plover and Oyster-catchers resort to the shingle beaches at the mouth of the Dovey. The Teifi Bog, near Tregaron, is noteworthy as being an inland breeding-haunt of the Lesser Black-backed Gull, the colony numbering some fifty pairs. In the hill-district those fine birds, the Raven and Common Buzzard, still hold their own. A pair or two of the Peregrine Falcon may continue to breed, but this bird is now better known as a winter visitor.

Summer Visitors.—These are about thirty in number : Ring Ouzel, Wheatear, Whinchat, Redstart, Common Whitethroat, Lesser Whitethroat, Blackcap, Garden Warbler, Chiff-chaff, Willow Warbler, Wood Warbler, Sedge Warbler, Grasshopper Warbler, Yellow Wagtail, Tree Pipit, Red-backed Shrike, Spotted Flycatcher, Pied Flycatcher, Swallow, House Martin, Sand Martin, Swift, Nightjar, Cuckoo, Turtle Dove, Quail, Landrail or Corncrake, Common Sandpiper, Lesser Tern.

Several of these, as the Grasshopper Warbler, vary in numbers from year to year. Some years may pass without the Quail being noted, then comes a favourable season when it is fairly numerous. The Lesser Whitethroat rarely reaches this district, having been

noted by the writer three times only in the course of seventeen years. Such species as the Blackcap and Garden Warbler naturally only occur where there is suitable cover, *i.e.*, in sheltered woods and thickets. The Pied Flycatcher frequents oak-woods at Llyfnant Valley, Nanteos and Hafod. The Yellow Wagtail is a local bird in this district, breeding only about rushy meadows in the vicinity of Borth and Tregaron Bogs. The Turtle Dove appears to be decidedly upon the increase.

Winter Visitors.—Confining this term to species which are met with with some degree of regularity every winter, we find them only about thirty in number: Redwing, Fieldfare, Siskin, Tree Sparrow, Brambling, Snow Bunting, Short-eared Owl, White-fronted Goose, Brent Goose, Bewick's Swan, Shoveller, Pintail, Wigeon, Pochard, Tufted Duck, Scaup, Golden-eye, Common Scoter, Goosander, Red-breasted Merganser, Spotted Crake (may breed), Woodcock, Jack Snipe, Purple Sandpiper, Redshank (may breed), Common Gull, Great Northern Diver, Black-throated Diver, Red-throated Diver.

The Bittern should perhaps be included, as it revisits its former haunts, Borth and Tregaron Bogs, almost annually. Mr. Hutchings always receives Bitterns for preservation when a few days of hard frost occur.

Passing Migrants.—These chiefly consist of wading birds which spend a few days upon the sand-flats and mud-banks of the Dovey estuary when upon their southward passage in autumn or in the course of their return journey in spring: White Wagtail, Grey Plover, Turnstone, Little Stint, Curlew Sandpiper, Knot, Sanderling, Wood Sandpiper, Green Sandpiper, Greenshank, Bar-tailed Godwit, Whimbrel, Common Tern, Arctic Tern.

Casuals.—This heterogeneous group includes all the

remaining birds which are known to have visited the district, their occurrence being so irregular that they cannot be included in any of the foregoing lists : Black Redstart, Nuthatch, Golden Oriole, Great Grey Shrike, Waxwing, Crossbill, Hooded Crow, Wryneck, Hoopoe, Yellow-billed Cuckoo, Marsh Harrier, Hen Harrier, Montagu's Harrier, Rough-legged Buzzard, Hobby, Shag, Gannet, Little Bittern, Spoonbill, Grey-lag Goose, Bean Goose, Pink-footed Goose, Bernicle Goose, Whooper or Wild Swan, Garganey, Gadwall, Long-tailed Duck, Velvet Scoter, Smew, Black Grouse, Cream-coloured Courser, Dotterel, Grey Phalarope, Great Snipe, Ruff, Black-tailed Godwit, Black Tern, Sabine's Gull, Little Gull, Glaucous Gull, Iceland Gull, Ivory Gull, Great Skua, Pomatorhine Skua, Richardson's Skua, Little Auk, Great Crested Grebe, Red-necked Grebe, Sclavonian Grebe, Fulmar, Collared Petrel, Fork-tailed Petrel, Storm Petrel.

The occurrence of these birds within the limits of our district is due to a variety of causes. The Gannet and Shag have breeding colonies at no great distance. Some, as the Golden Oriole and Hoopoe, lose their bearings and may thus reach us during the spring migration. Others occur by chance upon their autumn passage ; such are the Great Snipe, Ruff and Black-tailed Godwit. A gale in early autumn usually brings the Grey Phalarope, Sabine's Gull and some of the Skuas. Rough or unusually severe weather in winter causes an immigration (chiefly to the Dovey) of several varieties of Ducks and Wild Geese which do not occur there in a more open season, while some of the Arctic Gulls, as the Iceland and Glaucous, will be met with off the coast. Lastly, a few are the merest waifs and strays. Such are the Yellow-billed Cuckoo, an American species, picked up dead at Clarach in 1870 ; the Cream-coloured Courser, a bird of the North African deserts,

shot at Ynyslas in 1886, and the Collared Petrel, a wanderer from the South Seas, obtained near Borth at the close of 1889. The fact that the Marsh and Hen Harrier, formerly so numerous upon the great peat-bogs of the county, have now become rare stragglers, exemplifies the changes which have taken place in our fauna owing to drainage and increased cultivation.

Insects

The following Butterflies are to be met with in North Cardiganshire. None of the other orders of Insects have been sufficiently studied as yet to allow of lists being given.

Pieris Brassicae, Large Cabbage White.

P. Rapae, Small Cabbage White.

P. Napi, Green-veined White.

Euchloe Cardamines, Orange-Tip.

Colias Edusa, Clouded Yellow. Occasional.

Thecla Betulae, Brown Hairstreak. Not uncommon in August.

T. Rubi, Green Hairstreak. Abundant in May.

Polyommatus Phlœas, Small Copper.

Lycœna Icarus, Common Blue.

L. Argiolus, Azure Blue or Holly Blue.

Vanessa C. Album, Comma. Not uncommon, usually in April.

V. Urticae, Small Tortoiseshell.

V. Io, Peacock.

V. Atalanta, Red Admiral.

V. Cardui, Painted Lady.

Melitæa Artemis, Greasy Fritillary. Scarce. Boggy spots near Parson's Bridge.

Argynnis Paphia, Silver-washed Fritillary.

A. Aglaia, Dark Green Fritillary.

A. Adippe, High-brown Fritillary.

A. Euphrosyne, Pearl-bordered Fritillary.

A. Selene, Small Pearl-bordered Fritillary.
Satyrus Semele, Grayling.
Pararge Megæra, Wall Brown.
P. Egeria, Wood Argus or Speckled Wood.
Epinephile Hyperanthus, Ringlet.
E. Janira, Meadow Brown.
E. Tithonus, Large Heath.
Coenonympha Pamphilus, Little Heath.
C. Davus, Marsh Ringlet. Borth and Tregaron peat-bogs.
Syricthus Malvae, Grizzled Skipper.
Nisoniades Tages, Dingy Skipper
Hesperia Thaumas, Small Skipper.
H. Sylvanus, Large Skipper.

NOTES ON THE MARINE LIFE OF THE SHORES OF CARDIGANSHIRE

C. L. WALTON, H. J. FLEURE, and F. S. WRIGHT

CARDIGAN BAY forms a great broad hollow in the western coast of Britain, enclosed between the projection of Pembrokeshire on the south and the peninsula of Lleyn (Carnarvonshire) on the north. It is probable that the Bay was temporarily transformed into low-lying land by the accumulation of boulder clay on it during the Ice Age, and certainly there must have been great pebble ridges along the sea-coast of that ancient land due to the washing out of the clay in which the boulders lay. The sea has eaten into that low land and has ultimately swamped all of it except some few patches here and there, where a low shore zone skirts the base of ancient sea-cliffs, or where the boulder clay's cut edge remains along the coast. The clay of which the land was composed has remained to a considerable extent and forms the sea-floor of the bay, which is on the whole shallow, patches outside Aberystwyth being particularly so.

It follows from what has been said that the volume of sea-water in Cardigan Bay is not large and the tidal currents act strongly on it, while wave-disturbances from the Atlantic affect it very powerfully, easily stirring up the muddy bottom and giving rise to huge waves, especially in the centre of the shore-line, near Aberystwyth. The prevalent winds being, as usual, south-westerly, the persistent set of drifts in the bay is from

south-west northward, and the water shifts onward in that direction a very large quantity of boulder clay pebbles originally embedded in the soil of the swamped area. These pebbles, and the material worn from them, travel northward along the shore until they reach some point where the sea-drift is deadened by the opposing current of some river, or by some other cause, and there they accumulate forming a storm beach. A storm beach has turned the Ystwyth northward, and the Lery at Borth offers an even better example. The Clarach has the same feature on a smaller scale. The large amount of detritus carried alongshore by the waves is therefore one of the features of the Cardiganshire coast, and a special accumulation has occurred on what may have been an old land or shallow sea area forming Sarn Wallog.

Another marked characteristic of Cardigan Bay is the large amount of muddy fresh water it receives from time to time. A line of hills with its chief dome at Plynlimmon runs parallel to the coast, receives the rain-laden winds, and thus feeds many streams with steep tracks that prevent deposition on any large scale before the rivers reach the sea. It therefore happens that, especially after rain, the inshore waters are discoloured for some distance from a river mouth, chiefly to the northward, because the rain-winds are from the south-west and drive the surface waters on. The junction between the surface of the muddy fresh water, which floats over sea-water, and the clear sea is often very plain.

Naturalists well understand that the heavy drift alongshore and the large amount of muddy fresh water both, on the whole, adversely influence the shore fauna. The rocks are grits and shales almost devoid of lime, and for this reason, and because they and the boulder clay wear fairly evenly and leave a regular and almost uniformly exposed coastline, they also are unfavourable to the existence of a normal fauna.

Of all the groups thus far studied, it is the sea-snails that show the most interesting peculiarities of distribution.

Patella vulgata, L., the common limpet, is very abundant, and hollows out homes for itself in the rock. It has the height of its shell frequently corresponding to the height of the groove or crevice in which it lives.

The species of *Trochus* (Top Shells) raise some interesting questions. Only one small specimen of *T. zizyphinus,* L., has been found. *T. cinerarius, L., T. umbilicatus,* Mont., and *T. crassus,* Mont. (*lineatus,* Da Costa), are absent between a line about two miles south of Aberystwyth and a line beyond Towyn, Merioneth ; they come in again to the north and are very abundant to the south. The barren area receives most of its shore drainage from lime-free slates and grits, while the fruitful patches receive water from boulder clay (in the south) and the same and igneous rocks (in the north). *T. crassus* is as usual a high-water form, but it swarms along the shore course of streamlets from the boulder clay. When the boulder clay disappears, south of Monk's Cave, *Trochus* becomes rarer for a while.

Littorina is very common. *L. litorea,* L., and *L. obtusata,* L., are common almost everywhere, while *L. rudis,* Maton., is abundant along high-water line, its young seeking shelter in empty *Balanus* shells. *L. neritoides,* L., is found in many places above tide mark, but is not as common as the others ; it seems to need spray and favours shady crevices in steep rock slopes. *L. rudis* is more abundant in the *Trochus* zones and one finds local colonies of large individuals. The same is true for *L. litorea,* so probably the same conditions adversely affect both *Trochus* and *Littorina* in the Aberystwyth district, but *Littorina* survives more or less in spite of them.

The same region between Ystwyth and Dyfi appears

also to be hostile to certain Algæ, notably *Stilophora rhizoides, Mesoglœa vermiculata, Dictyota dichotoma* and *Laurencia hybrida*, which are absent from it, and *Chondrus crispus* and *Castagnea virescens*, which become much more common outside it. The probable relation of this distribution of Algæ to the distribution of *Trochus* above discussed is being made the object of study. *Fucus* and *Ascophyllum* decrease markedly, on this coast at any rate, in the *Trochus* areas. The list of Algæ appended is the result of work undertaken in connection with a study of the natural history of *Trochus*, and is no doubt still far from complete. Mr. C. M. Green has given great assistance as regards Algæ, and Professor Harvey Gibson has kindly confirmed the identifications of doubtful specimens in several cases. Dr. O. V. Darbishire's help is gratefully acknowledged.

The fauna in general varies from place to place according to the strike and dip of the rocks exposed on the shore, and according to the amount of exposure and the quantity of detritus washing to and fro in the gullies between the rock ridges. If the strike of the rocks is fairly parallel with the coast, the dip of the rocks becomes an important question ; if it is low, the whole surface is exposed to wave wash and the rocks are barren ; if it is high with a landward dip they are also barren, but if high and seaward there may be a fairly good fauna on the more sheltered landward slope. Outlying reefs may provide shelter even if submerged, because they break the strength of a ground swell and lessen the amount the wave can carry or move.

The lists are in no sense complete, and they exclude as far as possible specimens merely washed up, though as regards *Crustacea* it is impossible to draw an exact line. Dredged specimens are not included, save among the Fishes. The *Echinoderms* and *Ascidians* are very poorly represented, and point to the lack, on this coast, of

narrow shallow channels through which the incoming and outgoing tides can race. Though the Aberystwyth shore itself is not favourable to certain types, as already explained, it is none the less the most fertile patch as regards the fauna in general, though something must no doubt be allowed for the fact that it is so much more accessible, and has been examined at all seasons.

The lists in some groups call for no special comment, but attention may be drawn to the fairly good list of sea-slugs, the eleven species identified thus far having been collected in autumn and winter at Aberystwyth, where they are, at the best, very rare in summer time.

Among the higher *Crustacea* we notice the finding of a specimen of *Axius stirhynchus* by Mr. F. S. Wright, and the occasional appearance of large numbers of *Galathea squamifera* in early summer on the sheltered side of the main reef at Aberystwyth. *Dromia vulgaris* is a species about the littoral nature of which there may well be question. *Pirimela denticulata* and *Pilumnus hirtellus* have been found. *Porcellana platycheles* is very abundant, whereas *P. longicornis* is found only occasionally, and this seems to have some relation to the amount of mud in the water, for *P. longicornis* certainly favours spots which are washed by strong currents of clear sea-water on other coasts.

Crabs which have been obtained by dredging in Cardigan Bay include, in addition to various members of the shore fauna listed in their place, the following:

Portunus holsatus, Fabr.
Inachus dorsettensis, Penn.
Stenorhynchus phalangium, Penn.
Hyas coarctatus, Leach.
Hyas araneus, Linn.
Pisa tetraodon, Penn.
Pisa Gibbsii, Leach.
Corystes cassivelaunus, Penn.

It is difficult and not very profitable to settle which fishes belong to the littoral and which to the more open sea, so the list given is a list for Cardigan Bay, a list still very

incomplete but not without its features of interest. The bay is fairly rich in flat fish living on the muddy bottom and specially abundant in gutters of the sea-floor, such as one off Llanrhystyd and Llanon. Herring have come in occasional shoals into Cardigan Bay and are noticed as early as 1206, while rights and dues in connection with the fishery figure in some transactions of bygone centuries. It is said that the Herring in the bay spawn somewhere off the Dyfi estuary on their way north, but this and other details of habits need renewed investigation. Attention may be drawn to the occurrence of *Lepadogaster Decandolii, Trachinus draco, Gasterosteus spinachii, Liparis Montagui* and others which are quite infrequent. Of course *Lamna cornubica* is merely a very occasional visitor, and neither *Myliobatis aquila* nor *Rhina squatina* are at all frequent.

The assistance and advice of Dr. J. Travis Jenkins has been exceedingly valuable during the studies embodied in this short report, and other friends have also assisted. Specimens should be sent to Aberystwyth for identification with a view to increasing the lists, as many common things still remain unrecorded.

LIST OF LITTORAL ALGÆ

A—Aberystwyth, C—Clarach and north, S—Allt Wen and south

Chlorophyceae

Enteromorpha compressa, Grev. ; A, C, S.
Enteromorpha linza, J. Ag. ; C.
Enteromorpha intestinalis, J. Ag. ; A, C, S.
Ulva latissima, J. Ag. ; A, C, S.
Chaetomorpha melagonium, Kütz. ; A, S.
Chaetomorpha tortuosa, Kütz. ; A.
Cladophora pellucida, Kütz. ; A.
Cladophora albida, Kütz. ; A, C.
Bryopsis plumosa, C. Ag. ; A, C.

PHAEOPHYCEAE

Desmarestia aculeata, Lamx. ; A, C.
Dictyosiphon fœniculaceus, Grev. ; A.
Striaria attenuata, Grev. ; A, C, S.
Punctaria plantaginea, Grev. ; A, C.
Myriotrichia clavæformis, Harv.
var. filiformis, Farl. ; A.
Asperococcus echinatus, Grev. ; A.
Streblonema fasciculatum, Thur. ; A.
Ectocarpus confervoides, Le Jol. ; A, C.
var. siliculosa, Kjell.
E. tomentosus, Lyngb. ; A, S.
Pylaiella litoralis, Kjell. ; A.
Elachista fucicola, Fries. ; A.
Sphacelaria cirrhosa, C. Ag. ; A.
Sphacelaria plumigera, Holm. ; A.
Cladostephus spongiosus, C. Ag. ; A, C, S.
Cladostephus verticillatus, C. Ag. ; A, C.
Stypocaulon scoparium, Kütz. ; C, S.
Ralfsia verrucosa, Aresch. ; A.
Stilophora rhizoides, J. Ag. ; S.
Chordaria flagelliformis, C. Ag. ; A, S.
Mesoglœa vermiculata, Le Jol. ; S.
Castagnea virescens, Thur. ; A, S.
Castagnea griffithsiana, J. Ag. ; A.
Leathesia difformis, Aresch. ; A, C, S.
Phyllitis fascia, Kütz. ; A.
Scytosiphon lomentarius, J. Ag. ; A, C, S.
Chorda filum, Stackh. ; A.
Laminaria saccharina, Lamx. ; A, C, S.
Laminaria digitata, Edm. ; A, C, S.
Fucus vesiculosus, Linn. ; A, C, S.
Fucus serratus, Linn. ; A, C, S.
Ascophyllum nodosum, Le Jol. ; A, C, S.
Halidrys siliquosa, Lyngb. ; A, C, S.
Dictyota dichotoma, Lamx. ; S.

RHODOPHYCEAE

Bangia fuscopurpurea, Lyngb. ; C.
Porphyra linearis, Grev. ; A.
Chondrus crispus, Stackh. ; A, S.
Gigartina teedii, Lamx. ; A.
Phyllophora membranifolia, J. Ag. ; A.
Ahnfeldtia plicata, Fries. ; A.
Cystoclonium purpurescens, Kütz. ; A.
Gracilaria confervoides, Grev. ; C.
Rhodymenia palmata, Grev. ; A.
Lomentaria articulata, Lyngb. ; A.
Laurencia hybrida, Lenorm. ; S.
Polysiphonia urceolata, Grev. ; A.
var. patens, J. Ag.
Polysiphonia elongata, Grev. ; S.
Polysiphonia violacea, Wyatt ; A.
Polysiphonia nigrescens, Grev. ; A.
Plumaria elegans, Bonnem. ; S.
Ceramium strictum, Harv.
var. divaricata, Holm. and Batt. ; A.
C. diaphanum, Roth. ; A.
C. rubrum, C. Ag. ; A.
var. proliferum, J. Ag.
C. acanthonotum, Carm. ; A.
C. ciliatum, Ducluz ; A.
Dumontia filiformis, Grev. ; A.
Furcellaria fastigiata, Lamx. ; S.
Polyides rotundus, Grev. ; A.
Hildebrandtia prototypus, Nard.
var. rosea, Kütz. ; A, C, S.
Lithothamnion polymorphum, Aresch. ; A, S.
Corallina officinalis, Linn. ; A, C, S.

LIST OF LITTORAL FAUNA

A—Aberystwyth, C—Clarach and north, S—Allt Wen and south

PORIFERA

Sycon compressum, Fleming ; A.
Sycon coronatum, Ellis and Sol. ; A.
Halisarca Dujardini, Johnst. ; A.
Halichondria panicea, Pallas ; A, C, S.
Hymeniacidon sanguineum, Grant ; A.

COELENTERATA

Podocoryne carnea, Sars. ; A.
Coryne vaginata, Hincks. ; C.
Zauclea implexa, Alder ; A.
One colony collected by Dr. Salter, 1907.
Obelia geniculata, Linn. ; A, C, S.
Sertularia pumila, Linn. ; A, C, S.
Plumularia echinulata, Lam. ; A.
Plumularia pinnata, Linn. ; A, C, S.
Plumularia similis, Hincks. ; A.
Actinia equina, Linn. ; A, C, S.
Anemonia sulcata, Penn. ; A, S.
Sagartia miniata, Gosse ; A.
Sagartia undata, O. F. Müll. ; A, C.
Sagartia ornata, Holdsworth ; A.
Tealia coriacea, Cuvier ; A, C, S.

ECHINODERMATA

Henricia sanguinolenta, O. F. Müll. A.
Asterias rubens, Linn. ; A.
Amphiura sp. ; A, C, S.

TURBELLARIA

Fovia affinis, Stimpson ; A.
Leptoplana tremellaris, O. F. Müll. ; A, C, S.

NEMERTEA

Amphiporus lactifloreus, Johnst. ; A.
Lineus longissimus, Gunn. ; A.
Tetrastemma sp. ; A.
Dinophilus taeniatus, Harmer ; A.

Annelida

Lagisca floccosa, Savigny ; A.
Eulalia viridis, Müll. ; A.
Psamathe fusca, J. ; A.
Psamathe punctata ; C.
Castalia punctata, Müll. ; A.
Nereis pelagica, Linn. ; A.
Sthenelais boa, Johnst. ; A.
Polynœ sps. ; A.
Lycidice sp. ; A.
Terebella sp. ; A.
Cirratulus cirratus, O. F. Müll. ; A.
Pomatoceros triqueter, Linn. ; A.
Spirorbis borealis, Daudin ; A, C, S.
Sabellaria alveolata, Linn. ; A, C.

Sipunculoidea

Sipunculus nudus, Linn. ; A.
One specimen collected by Miss D. Turner, 1899.

Polyzoa

Scrupocellaria reptans, Linn. ; A.
Membranipora pilosa, Linn. ; A, C, S.
Membranipora membranacea, Linn. ; A.
Crisia cornuta, Linn. ; A.
Crisia denticulata, Lam. ; A.
Alcyonidium hirsutum, Fleming ; A, C.
Pedicellina cernua, Pallas ; C.

Mollusca

Chiton fascicularis, Linn. ; A, S.
Chiton cinereus, Linn. ; A.
Chiton marginatus, Penn. ; A, C.
Acmæa virginea, Müll. ; A, rare.
Patella vulgata, Linn. ; A, C, S.

Helcion pellucida, Linn. ; A.
Fissurella græca, Linn. ; A.
Trochus cinerarius, Linn. ; S.
Trochus umbilicatus, Mont. ; S.
Trochus crassus, Mont. ; S.
Trochus zizyphinus, Linn. ; A.
One small specimen found.
Lacuna divaricata, Fabr. ; A.
Lacuna puteolus, Turt. ; A.
One specimen, living among *Balanus perforatus*.
Littorina litorea, Linn. ; A, C, S.
Littorina neritoides, Linn. ; A, C, S.
Littorina obtusata, Linn. ; A, C, S.
Littorina rudis, Maton. ; A, C, S.
Trivia Europœa, Mont. ; A, rare on the shore.
Purpura lapillus, Linn. ; A, C, S.
Nassa reticulata, Linn. ; A.
Eolidia papillosa, Linn. ; A.
Facelina Drummondi, Thomp. ; A.
Facelina coronata, Forb. and Goodsir ; A.
Doto coronata, Gmelin ; A.
Archidoris tuberculata, Ald. and Han. ; A.
Jorunna johnstoni, Ald. and Han. ; A, rare.
Polycera Lessoni, D'Orb. ; A.
Acanthodoris pilosa, Müll. ; A, rare.
Lamellidoris bilamellata, Linn. ; A.
Goniodoris nodosa, Mont. ; A, C.
Ancula cristata, Alder ; A.
Anomia ephippium, Linn. ; A, C, S.
Mytilus edulis, Linn. ; A, C, S.
Mytilus barbata, Linn. ; C.
Donax vittatus, Da Costa ; Borth.
Tapes decussatus, Linn. ; A.
Tapes virgineus, Linn. ; Borth, etc.
Saxicava rugosa, Linn. ; A, C, S.
Eledone cirrosa, Lam. ; A.

CRUSTACEA

Canthocamptus palustris, Brady ; A, C, S.
Lernæa sp. ; A.
Lepeopotheirus sp. ; A.
Balanus balanoides, Linn. ; A, C, S.
Balanus perforatus, Brug. ; A, C, S
Chthamalus stellatus, Poli. ; A.
Verruca Strömia, O. F. Müll. ; A.
Sacculina carcini, Thomp. ; A, C, S.
Dexamine spinosa, Mont. ; A.
Gammarus pulex, De Geer. ; A.
Gammarus locusta, Linn. ; A.
Caprella linearis, Linn. ; A.
Calliopius leviusculus, Kr. ; A.
Idotea tricuspidata, Des. ; A.
Idotea marina, Linn. ; A.
Idotea pelagica (?), Leach ; A.
Sphæroma serratum, Fabr. ; A.
Jæra albifrons, Mont. ; A.
Anceus Edwardii, Risso ; A.
One specimen found.
Ligia oceanica, Linn. ; A.
Leander serratus, Penn. ; A.
Homarus vulgaris, H. M. Edw.
Crangon vulgaris, Linn. ; A.
Hippolyte varians, Leach ; A.
Athanas nitescens, Leach ; A.
Axius stirhynchus, Leach ; A.
Galathea squamifera, Leach ; A.
Porcellana platycheles, Penn. ; A.
Porcellana longicornis, Linn. ; A.
Eupagurus bernhardus, Linn. ; A.
Portunus puber, Linn. ; A.
Carcinus mænas, Penn. ; A.
Cancer pagurus, Linn. ; A.
Pirimela denticulata, Mont. ; A.

Pilumnus hirtellus, Linn. ; A.
Dromia vulgaris, H. M. Edw. ; A.

PYCNOGONIDA

Pycnogonum littorale, Stroem ; A.
Nymphon gracile, Leach ; Borth.

TUNICATA

Styelopsis grossularia, V. Ben. ; A.
One specimen found on rock.
Botryllus violaceus, M. Edw. ; A.
Botrylloides sp. ; A.

PISCES, CARDIGAN BAY

Scyllium canicula, Cuv.
Scyllium catulus, Cuv.
Acanthias vulgaris, Risso.
Galeus vulgaris, Hem.
Rhina squatina, Linn.
Raia clavata, Linn.
Raia batis, Linn.
Raia microcellata, Mont.
Raia circularis, Couch.
Raia maculata, Mont.
Raia radiata, Don.
Myliobatis aquila, Cuv.
Torpedo nobiliana, Bonap.
Lamna cornubica, Gm.
Blennius pholis, Linn.
Blennius gattoruginae, Bl.
Cottus bubalis, Euph.
Centronotus gunnellus, Bl.
Motella tricirrata, Nils.
Motella mustela, Linn.
Lepadogaster decandolii, Risso.
One specimen found at Aberystwyth.
Liparis Montagui, Don.

Liparis vulgaris, Hem.
Orthagoriscus mola, Linn.
Lophius piscatorius, Linn.
Nerophis lumbriciformis, Willugh.
Belone vulgaris, Hem.
Gasterosteus spinachia, Linn.
Trigla gurnardus, Linn.
Trigla hirundo, Linn.
Trigla cuculus, Linn.
Zeus faber, Cuv.
Crenilabrus melops, Cuv.
Ctenolabrus rupestris, Linn.
Gadus luscus, Linn.
Gadus merlangus, Linn.
Gadus pollachius, Linn.
Cyclopterus lumpus, Linn.
Trachinus draco, Linn.
Clupea harengus, Linn.
Scomber scombrus, Linn
Zeugopterus punctatus, Bl.
Rhombus maximus, Cuv.
Rhombus lævis, Rond.
Arnoglossus megastoma, Don.
Solea vulgaris, Quen.
Solea lascaris, Risso.
Pleuronectes platessa, Linn.
Pleuronectes limanda, Linn.
Pleuronectes flesus, Linn.
Pleuronectes microcephalus, Don.

MEDIÆVAL BUILDINGS IN CARDIGANSHIRE

By E. TYRRELL GREEN, M.A., Professor of Hebrew and Theology, and Lecturer in Architecture in St. David's College, Lampeter.

THE mediæval buildings of Cardiganshire do not afford such interesting and varied material for study as those of some other districts of our land, for several reasons :—

(*a*) They are generally small and often quite insignificent in scale, a prevalent type of parish church in this part of Wales being simply a parallelogram on the plan, or a simple nave without aisles, having a smaller parallelogram for a chancel and only distinguishable from the cottages which are scattered along the hill side by a small bell-gable on the Western wall and perhaps a deeply recessed porch on one side.

(*b*) The churches are, in their execution, as a rule rude and poor ; the local stone does not admit of fine work, and there is very little in the way of window tracery, or carved capitals, or sculpture of any kind. In the poverty of its architecture Wales resembles mountainous countries in general. It is remarkable that where the works of nature are on a great scale and fine scenery abounds, man does not enter into competition with nature and the work of his hands is insignficant and mean. The architecture of mountain, moor and fell is in every land lacking in beauty and interest as compared with the stately fanes and soaring steeples of fen and marsh and plain.

(*c*) Monastic remains, which are usually amongst the grandest in scale and the finest in execution in any district, are here scanty. With the exception of a few small cells, like the one belonging to Whitland Abbey the remains of which may still be seen in the rocky gorge of the Teifi at Pontllwni, the only monastic settlements of any consequence were the Abbey of Strata Florida in the Northern part of the county and Cardigan Priory in its Southern extremity. Both are on a much grander scale than the purely parochial buildings and both, in fact, bear little or no relation to local architecture: especially is this the case with the great church at Strata Florida.

(*d*) A further and more serious drawback to the study of the ancient buildings of this part of Wales is the havoc that has been wrought upon them by the so-called restorer—a destruction so thorough and complete that there is comparatively little of mediæval building remaining in the county. The fever of church restoration seized this part of the country too soon—before the true principles which should guide the restorer were understood, or men had learned to pay due regard to the relics of the past. Thus during the 19th century all these churches were rebuilt—Llanfihangel-Geneu'r-Glyn, Llanrhystyd, Llanllwchaiarn, Llangwyryfon, Lledrod, Llanilar, Llanddeiniol, Llangeitho, Yspytty-Ystwyth, Tregaron, Llanddewi-Brefi, Lampeter, Silian, Llanwnen, Llanfair-Clydogau, Cellan, Trefilan, Nantcwnlle, Blaenpenal, Dihewyd, Llanina, Llanarth, Llanfihangel-Ystrad, Bettws-Ifan, Llangranog, Llechryd, Llandyfriog, Eglwysfach, Llandygwydd and Troed-yr-Aur, and of many of them it must be said that architecturally they are about as interesting as a County Schoolroom. So unsatisfactory were some of these restorations that within a short time after they were carried out it was thought desirable to rebuild the church yet again; thus at Lampeter, Trefilan and Llandygwydd the present

church is, in each case, the third which has stood on or near the same spot within 100 years, and it will readily be believed that nothing of any interest has survived. Vandalism was—except in some of the more recent restorations, *e.g.*, Llangeitho and Cellan—rampant when the Cardiganshire churches were restored. At Llanarth, Tregaron, Llanwnen, Llanddewi-Brefi and Llanilar little or nothing remains of interest save the massive old towers: at Llanina where the old church has been swallowed up by the ever-encroaching sea only a carved beam from the rood screen has been preserved; screenwork was utterly destroyed at Silian, Llangwyryfon and Llanddeiniol, while ancient fonts where generations had received the sign of Redemption were cast out to serve as flower-pots or pig-troughs. In a few cases interesting old fonts have been recovered and placed again in the churches, as at Llanfair-Clydogau, Llanarth, Silian, Llanddeiniol, and Llanfihangel-y-Creuddyn; some have vanished beyond recall, while the Lampeter font still does duty at the neighbouring chapel-of-ease at Maestir.

Though at the outset we are thus rather discouraged in our task, the study of the old buildings in the county —or what remains of them—is by no means devoid of interest.

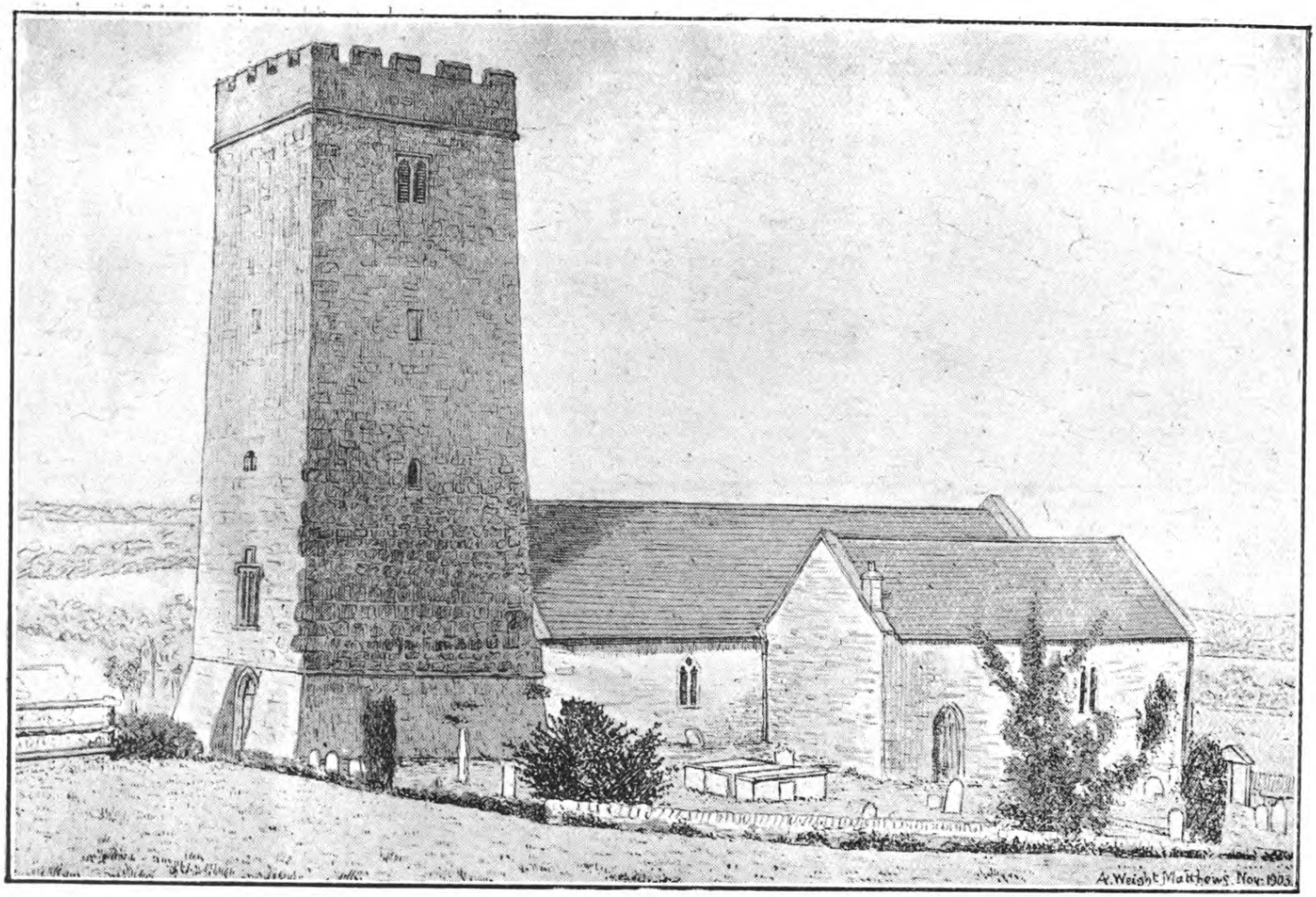
I.—The PARISH CHURCHES may be said to fall into three classes:

(1) *The simple and rude buildings common in mountainous districts* to which reference has been made above. We love and venerate these homely churches for their sacred associations and their picturesque and romantic situations, but as specimens of architecture they need scarcely detain us. Typical examples may be seen at Yspytty-Cynfyn, Llanafan, Gwnnws, Llanina, Llangybi, Llanfair-Clydogau, and at Mount in the south of the county. Though the present form of these buildings

may be modern in many cases, yet their sites are associated with the beginnings of Christianity in our land, and sometimes not only their sites but even their stones with an earlier period still. Thus the churches at Yspytty-Cynfyn and Gwnnws stand in the old circular enclosures, and the former is on the site of a Druidical circle, whose huge monoliths may yet be seen built into the enclosing churchyard wall, though an extension of the graveyard in recent times has done something to spoil the circle's form.

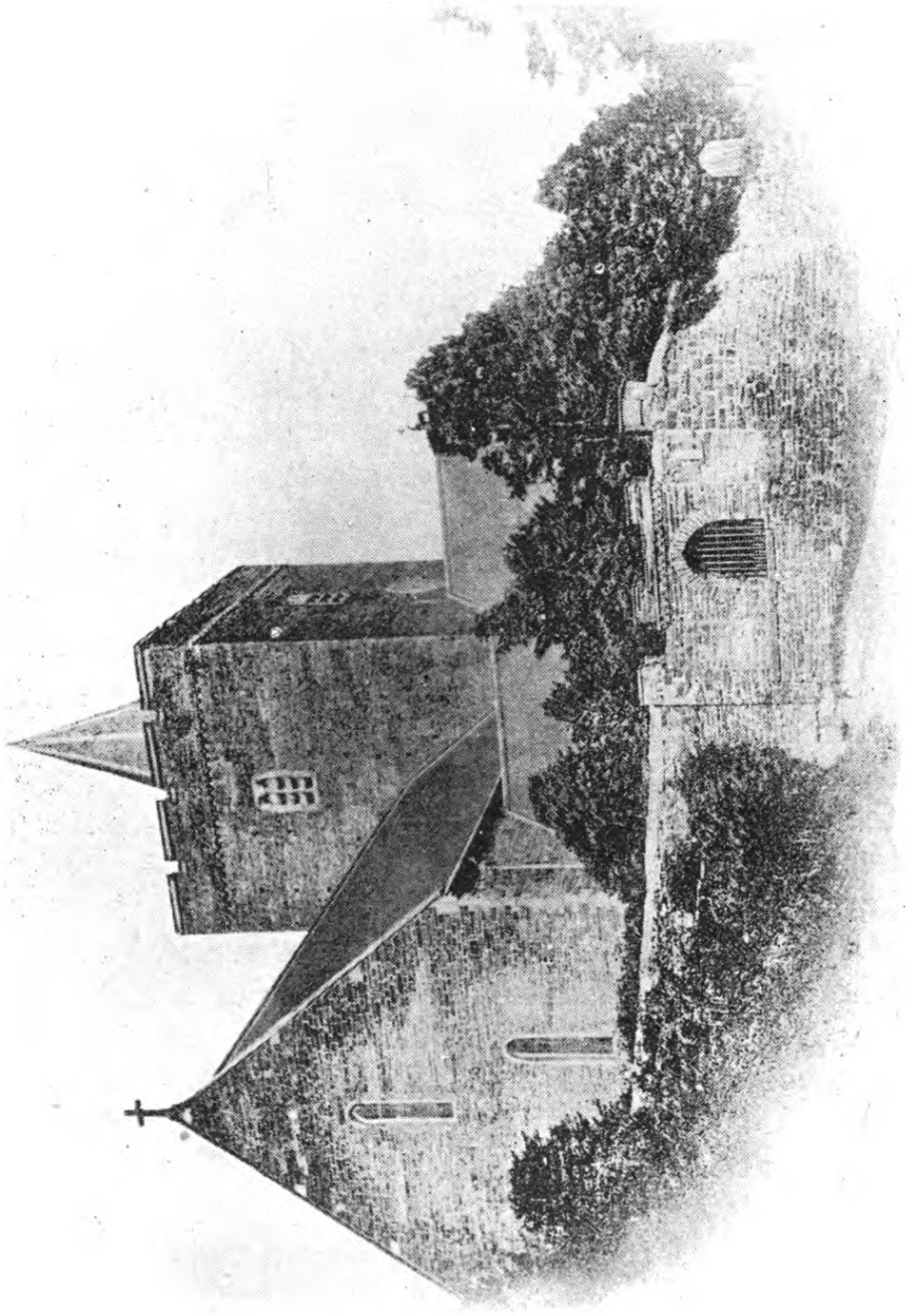
YSPYTTY-CYNFYN CHURCH. [*Photo, W. R. Hall.*

(2) *The second class of parish churches is marked by the presence of a Western tower*, massive in its proportions, often erected upon a spreading base—as at Tregaron and Llanwenog—battering noticeably, with very small belfry lights which are frequently mere slits or loopholes, crowned by a heavy battlement, and having a rectangular stair-turret at one angle, which is usually carried above the parapet. The whole structure has a severe, stern



LLANWENOG CHURCH.
From a drawing by A Weight Matthews, by permission of the Rev. Geo. Eyre Evans.

and fortress-like expression. If the first type of church mentioned tells of builders who were a homely, simple, mountain-dwelling folk, this second class of churches shows the work of men who were a fighting race, men who dwelt in a country disturbed by rovers from the sea and by internecine tribal strife. The churches are still for the most part rude and poor, but the towers are elaborated for defence, or—since architecture is very conservative and often retains forms which have outlived their proper use—are survivals from a time when such elaboration was necessary. In early times when dwelling-houses were of wattle and daub and churches of stone, it was natural that, on the approach of the enemy, the inhabitants should take refuge in the church, which was the one building capable of withstanding attack and of resisting fire. It was a natural step that the church should be further strengthened that it might be the better adapted to serve as a refuge and fortress in the day of trouble. The Cardiganshire towers are, as a rule, so massive and plain that the ordinary tests of date in architecture scarcely apply, and it is, therefore, difficult to determine the period of their erection. Some may be early, particularly those which show traces of Irish influence, such as the " stepped " form of battlement which appears at Llanarth and Llanwnen. Some however, are comparatively late, *e.g.*, the west tower at Llanwenog, which is perhaps the finest of this type in the county, was built in the fifteenth century and bears on its western face the arms of Sir Rhys ap Thomas, who supported Henry VII. in his struggle for the crown ; it is likely enough that others of these impressive towers may belong to the same period and to the same perpendicular style of architecture ; the latest of them is that at Cardigan—very good for its date (1711)—which no doubt follows the outline and general design of its predecessor on the same site. These churches with

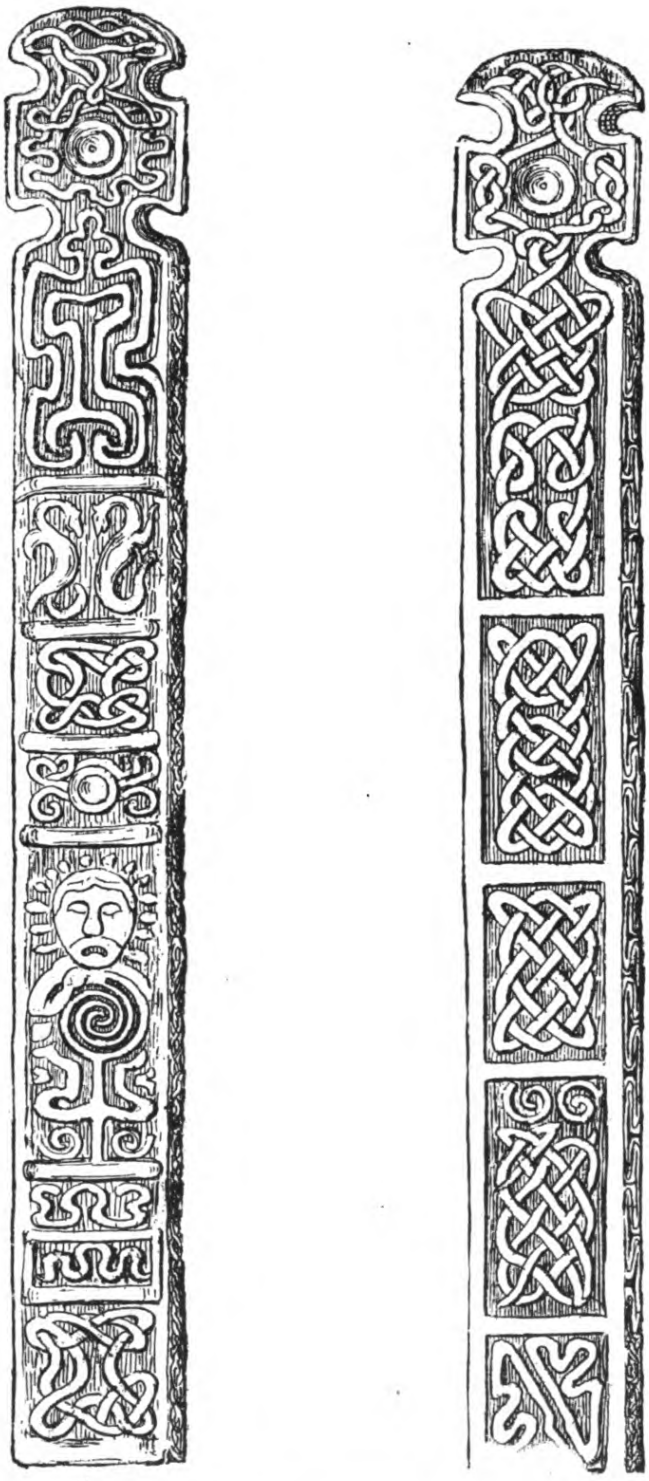


CHURCH OF LLANBADARN FAWR.

western towers are found, not in the Northern and more mountainous part of the county, but in some cases along the sea-board, as at Llanddeiniol, Llansaintffraed, Llanddewi-Aberarth, and Cardigan, and notably in a striking sentinel-like line down the Teifi valley from Tregaron southwards—

"Watchers of old, that far o'er hill and dale
Flashed the bright signal, 'Guard! the foe is near!"

(3) A third and grander type of church remains to be noted, though there are only a few examples of it in the county. This may be called *the early Welsh Cathedral and Collegiate type* and shows a simple and dignified aisleless building designed on a cruciform plan with massive towers covering a great area at the intersection of nave, chancel and transepts. The finest complete specimen of the type in Cardiganshire is the church of Llanbadarn. Here, in early days, was a bishop's seat contemporaneous with the see of St. David's in its foundation. At the beginning of the sixth century, Padarn with his friend Cadvan came over from Armorica and established a monastic college at the spot which has been named Llanbadarn after him, he himself becoming the first bishop. The see was, however, merged in the Diocese of St. David's in the early part of the eighth century, for the line of bishops who succeeded Padarn was brought to a close by the tragic death of Idnert in a raid upon the relics or treasures of the church; the memorial stone of the last bishop of Llanbadarn is built into the west wall of the church at Llanddewi-Brefi. The church at Llanbadarn was destroyed by Ithel and Madoc in 1106, but relics of the early Celtic Christian settlement remain in the crosses which still stand near the south porch. The taller of these is fairly well preserved and its shaft is covered with the interlacing ornament so characteristic of the work of the period both in stone monuments and in the



CROSS IN LLANBADARN CHURCHYARD. Front and back views.
From drawings by A. Weight Matthews, by permission of the Rev. Geo. Eyre Evans

illumination of MSS. The church was refounded by Gilbert de Clare in 1111, and was for some time attached to the Benedictine monastery of Gloucester. At this time the construction of the church on its present lines seems to have been begun ; it is a good, though on the

CHURCH OF LLANBADARN FAWR.—South door.

whole plain and severe, example of the Early English or First-Pointed style of architecture, with a few later insertions chiefly in the perpendicular style, and it presents in the beautifully proportioned south door of the nave, which is flanked by slender shafts bearing

graceful capitals of conventional foliage, one of the choicest gems in the county.

Next in point of size comes the church of Llanddewi-Brefi which stands in a commanding position on a knoll where the gorge of the little river Brefi opens out to the Teifi vale. The site it occupies is historic ground, for there was held a famous synod during St. David's own episcopate. The business for which the synod was called was, so some scholars tell us, to pass disciplinary canons for the clergy, but the most important work accomplished, according to cherished tradition, was a brilliant confutation of the Pelagian heresy by the saintly bishop. On the spot where the saint stood, Thomas Beck, his successor in the see seven centuries afterwards, a statesman-ecclesiastic and great church builder, founded in 1287 a collegiate church. On the foundation there were as many as fourteen prebends and the residence for those belonging to the college is said to have stood at a spot at the bottom of the hill to the south-east of the church, until recently called Lluest Cantorion (the Precentors' lodging). These prebends were doubtless often treated as sinecures, *e.g.*, it is scarcely probable that William of Wykeham ever resided at Llanddewi, though he received a prebend here in 1361. As was the case with many monastic and collegiate institutions the college seems to have declined very much long before the Reformation. In the reign of Henry VIII. the description given of the church was : " It standeth on high ground, but it is rude " ; and this still holds good. The church has been a well-proportioned cruciform building with massive central tower, its plan closely corresponding to that of Llanbadarn ; but it has suffered terribly. A picture, dated 1814, shows the chancel a ruin, and the transepts have now disappeared, their mutilated fragments still adhering to the exterior walls of the central tower, whose north

and south arches have been roughly walled in. The transepts were taken down in the nineteenth century probably because the church was too large for the congregation, and the whole building was thought too expensive to maintain in proper repair, but it is said that their walls were so strong that they had to be blown up with gunpowder. The tower yet stands whole and

LLANDDEWI-BREFI CHURCH.
Photo, A. J. Davies, Lampeter.

sound, but, save that the ancient and dignified proportions of the nave and chancel were preserved, the church was robbed of all interest at the restorations in the last century. Traces of the earlier sanctuary which stood here before the building of Bishop Beck's collegiate church may be seen in the shafts of Celtic crosses in the churchyard near the south-west angle

of the nave, one of them locally known as St. David's walking-stick, and in several interesting inscribed stones built into the walls ; of these the most easily deciphered, though now in two pieces inserted upside down in the west wall of the nave, is that that reads HIC JACET IDNERT FILIUS JA[COBI] QUI OCCISUS FUIT PROPTER PR[ÆDAM] SANCTI [DAVIDI], and commemorates the last bishop of Llanbadarn referred to above.

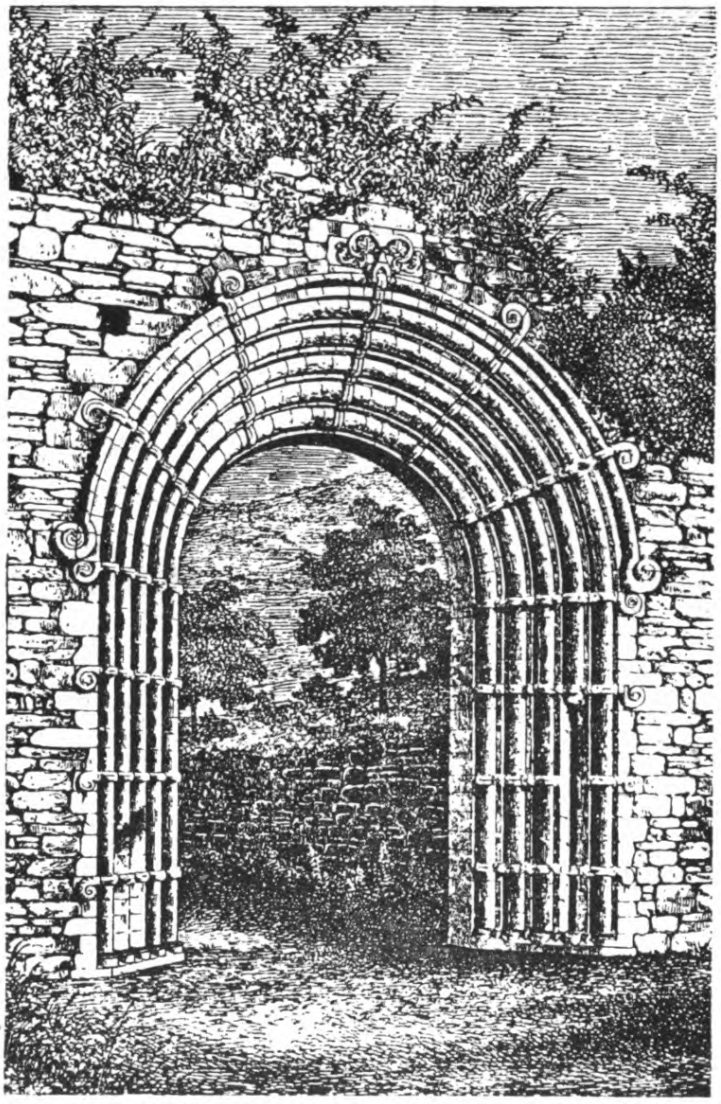
There is another church belonging to this same class at Llanfihangel-y-Creuddyn not far from Aberystwyth. Like most of the churches in the county it has been largely modernised, much rebuilding and alteration having been done between 1846 and 1850 as the vestry book shows. The plan is cruciform as at Llanbadarn and Llanddewi-Brefi with central tower of similar stern outline and finished with a like short pointed roof rising from within the parapet, but at Llanfihangel-y-Creuddyn the tower gains greatly in majesty of expression and appears taller and more graceful through being larger in proportion to the church of which it is the dominant feature.

II.—It is in the MONASTIC BUILDINGS of the county that the finest specimens of architecture are to be seen, though, as is often the case with buildings of this class, there is less of local character and influence to be observed in them.

(1) First must be mentioned, because of its great scale and the unique character of its adornment, the ruined Cistercian abbey of Strata Florida. Unfortunately, very little of the church remains standing, except at the West end, where the great door is almost intact, but its plan may be clearly traced, and it is remarkable that what little does remain has so much to tell us.

The Abbey of Strata Florida was founded on its present site (there had apparently been an earlier monastery at a spot about 2 miles to the South, still known as Hen Fynachlog) by Rhys ap Gruffydd, Prince of South

Wales 1164–6, and the great church must have been in building when Archbishop Baldwin of Canterbury stayed at the abbey on his tour through Wales in 1188, preaching the Crusade.



STRATA FLORIDA ABBEY.—West door.

The Cistercian rule which took its rise through a reform of the Benedictine Order from within in 1098 was marked by a stern simplicity and austerity of life, and the spirit of the Order found its outward expression in the severe

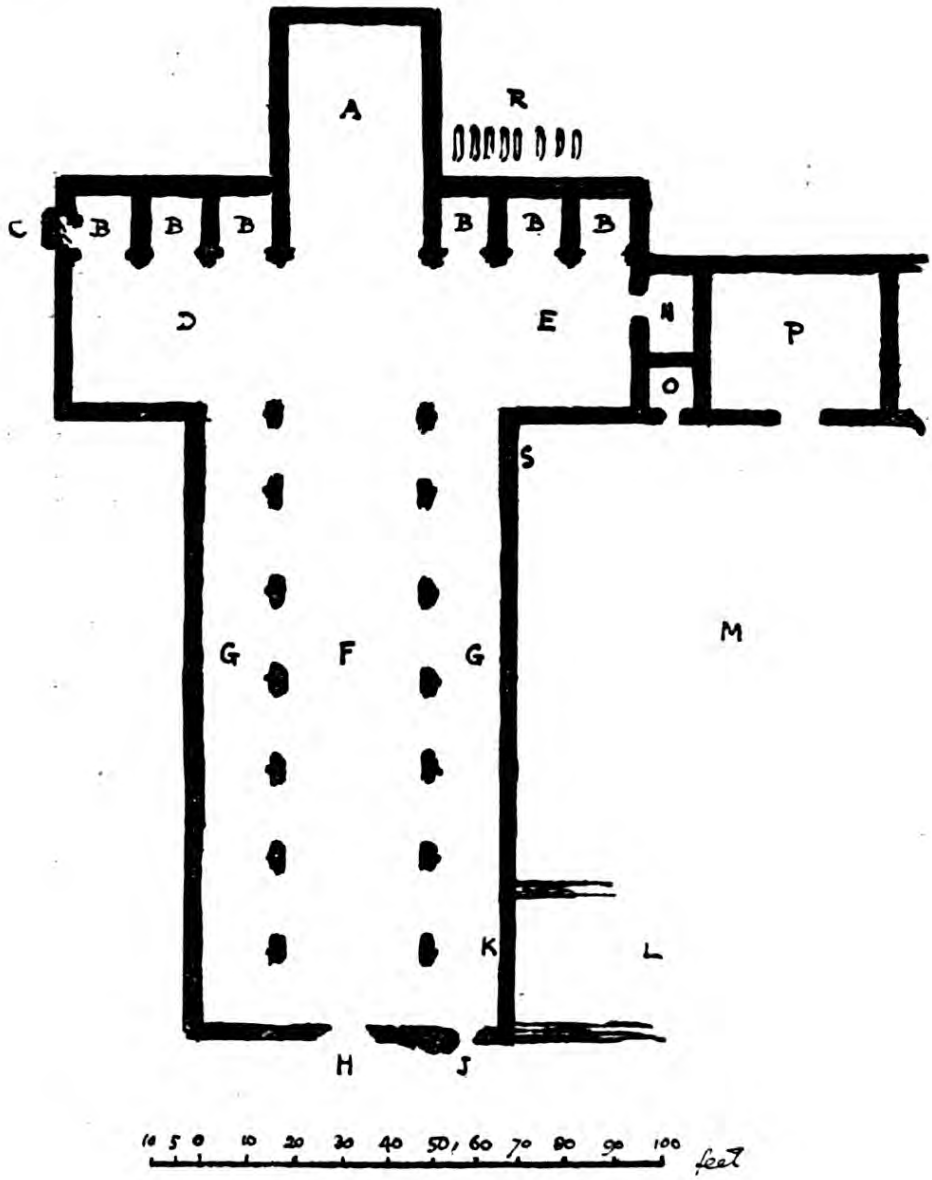
simplicity of the architecture of its churches ; it held up before men the sternest mode of life as the ideal, and refused the appeal of elaborate ritual and splendid art. Thus for many years the Cistercian Abbeys were characterized by a rejection of the richness and beauty which men commonly lavished on the sanctuary. By the rules of the Order stone bell-towers were forbidden, nor might the wooden belfry be a structure of any considerable size; representations of the human figure were not allowed in the carving of the church, other than statues of our Lord or the Crucifix. The windows were not to be filled with stained glass. The vestments used at the altar were to be of coarse linen, and jewels were not allowed in the sacred vessels. It is true that after a time this twelfth century Puritanism outgrew its fear of beauty and its laws in this respect were not so strictly kept, yet simplicity and restraint remained characteristic of the Order and are very marked features of its earlier abbey churches, such as Rievaulx, Fountains, Furness, Kirkstall, and this at Strata Florida.

The *plan* at Strata Florida shows a typical Cistercian abbey church and presents the peculiarities which marked the architecture of the Order. The chief of these are :

(*a*) The rectangular and aisleless choir. The Cistercian churches, like most of the greater churches of the time were cruciform, but the choir was short in proportion to the rest of the building, rectangular in its termination at the East end, and a simple parallelogram on the plan, without apse, aisles, projecting chapels, or procession path behind the high altar. Strata Florida furnishes an excellent example of this simple plan for the choir.

(*b*) Another peculiarity of Cistercian churches well illustrated at Strata Florida is the row of chapels (generally, as here, three in number) ranged along the East side of each transept. The chapels, at Strata Florida, had

stone vaults and the altars and altar-paces, with their well-preserved tiles *in situ* form a most interesting feature of the abbey ruins. The tiles are thought to be



STRATA FLORIDA ABBEY.
Plan of Church, drawn by F. S. Wright.

of Shropshire make, their patterns agreeing with examples found at Shrewsbury, Tong and Cound (all in Salop).

A date about the middle of the fourteenth century is indicated by the costume shown in the figure of a man borne by some of these tiles.

(*c*) Allusion has been made to the rule of the Cistercians by which stone bell-towers were excluded. One of the first reasons which led to the building of towers to churches was to provide a suitable structure for the bells, but many bell-towers were taller and more ornate than was necessary for this purpose. It was often in the height and adornment of the tower that the power and wealth of a founder, or the prosperity of a monastic corporation was indicated to the world. Bell-towers thus came to be regarded as emblematic of pride and wealth, and they were, therefore, considered out of keeping with the simple austerity which should mark the buildings of the Cistercian order. Those who designed Strata Florida were true to their regulations. There were no western towers, and if there was any structure above the roof level at the junction of nave, choir and transepts it could only have been a low lantern, because the piers at the crossing give no evidence of that extra thickening which would have been necessary had they been intended to carry the weight of a central tower. It was only at a much later period than that to which the structure at Strata Florida belongs that, in violation of the doctrine and discipline of the Order, towers were added to some Cistercian abbey churches, as at Fountains and Kirkstall.

With regard to *style of architecture*, it was in the latter half of the twelfth century that many of the great Cistercian abbeys were built, and this was a period of transition in architecture. It was then that the pointed arch began to be used by the builders of Western Europe, though the general character of their structures, with most of the detail and ornament, remained unchanged, so that between the Romanesque (or Norman)

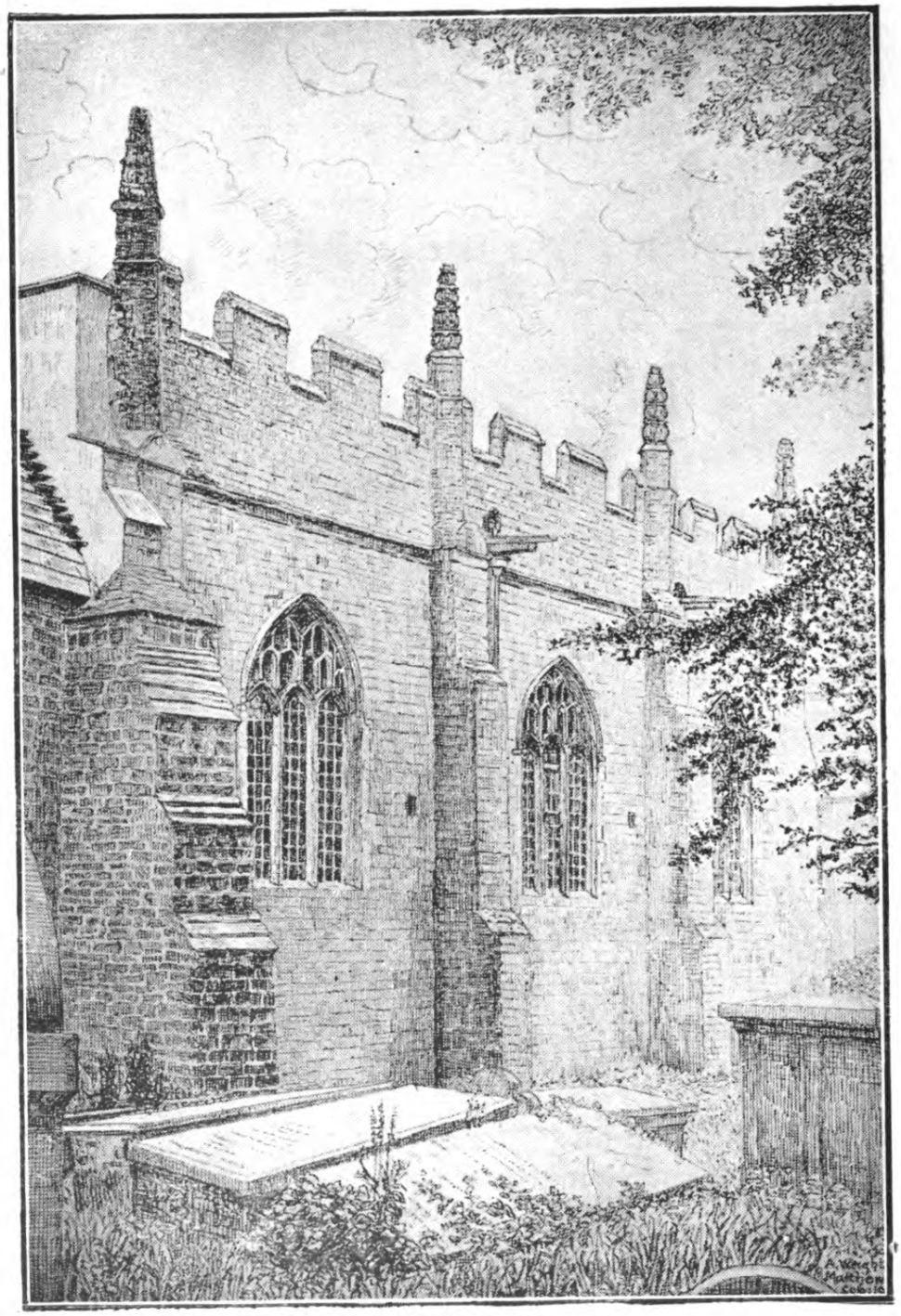
and the pointed styles there intervened a transition period when architectural style was still in its general character Romanesque, but the arch took the pointed form, especially when used in construction, the round-headed shape being retained for smaller openings such as doorways and windows. The somewhat scanty remains at Strata Florida, oddly enough, contain in the West wall arches of both kinds—the deeply recessed semi-circular arches of the great door and the pointed arch of the window to the South of it, thus showing that the church here was of the same transition style as great churches of the same Order like Kirkstall and Fountains, though built a little later.

In the tympana and arches of doorways of the later Norman style figures of men, animals and grotesque creatures often occur, but in the abbey churches of the Cistercians built during the first two centuries of the existence of the Order there are few, if any, exceptions to the rule which forbade decorative representations of the kind. Their churches had an air of solemn and severe grandeur, ornate carving being excluded and the capitals being ornamented only with a plain scallop (as at Fountains), or with simple mouldings (as at Tintern). The carved work at Strata Florida is exceptional. The capitals, bosses and other carved portions show ornament composed of curling and interlacing lines, such as we see in Celtic MSS. and monuments like the interesting example at Llanbadarn. Ornament of the same type may be seen, too, on the crosses which mark the graves in the monks' cemetery at Strata Florida. Yet another feature at the Abbey which suggests the influence of early Celtic art is the peculiar adornment of the splendid West door, where the mouldings run all round without capitals, as in some Irish examples, and the unique transverse bands terminate in scrolls or curls.

As was almost invariably the case in Cistercian houses

the domestic buildings at Strata Florida lay to the South of the church. The position of sacristy, chapter-house and cloister are clearly defined, but the other buildings have not been excavated and are difficult to trace. This may be partly due to the fact that the abbey suffered greatly through fire, having been struck by lightning in 1284, and burnt by the English soldiery in the Welsh wars of Edward I. (1294). It suffered, perhaps, even more through being used as a military post, for, during and after the troubles caused by the rising of Owen Glyndwr, it was occupied by a garrison of archers and men-at-arms in the reigns of Henry IV. and Henry V. Long before the dissolution of the monasteries many of the buildings seem to have been in ruins. But, notwithstanding the devastation of fire and sword, in spite of centuries of neglect and decay, and although its stones have served as a quarry for farm and other buildings in the neighbourhood, enough still remains of the once stately church to show that, like the other great churches of the Order, its construction and decoration alike evidenced that ascetic ardour, that temperate good taste, that straightforward procedure and practical utility which characterized the Cistercian rule.

(2) The other chief monument of monastic architecture in the county is the chancel of Cardigan church, once part of the Benedictine Priory. It forms a great contrast to the work at Strata Florida, belonging, as it does, to the latest period of pure Gothic, for it must have taken the place of an earlier structure less than 100 years before the dissolution of the house. The nave and tower at Cardigan were rebuilt in the early years of the eighteenth century—a dull and depressing period alike in church life and art, so that the chancel, good in itself, appears the more splendid by contrast with its surroundings. It is a spacious structure of three bays in fifteenth century perpendicular style of excellent kind, far superior



CHANCEL OF CARDIGAN CHURCH.
From a drawing by A. Weight Matthews, by permission of the Rev. Geo. Eyre Evans.

to any other work of the same period in this part of the country. Near the chancel arch remain two corbels formed of sculptured heads : the one on the North side is a female and wears a head-dress in vogue only for a short time in the reign of Henry VI. This fixes the date of the work. The windows are of unusually graceful shape for the period, rather sharply pointed and having finely moulded mullions and tracery. The East window is a large one of five lights, and still retains some fragments of the original glass ; it is said to have been intact until Colonel Johnes, possessor of the Priory estates at the beginning of the last century, removed the glass to his mansion at Hafod, where it was soon afterwards destroyed in the great fire. In the South wall is a beautifully finished piscina with crocketed ogee canopy and pinnacles, and an unusual feature in the shape of a conventional rose sculptured in the bowl. A grand air is given to the exterior by a battlemented parapet and a range of well-finished buttresses, each crowned by a graceful pinnacle. Though not large in scale as compared with works in the same style in some parts of the country, this chancel at Cardigan is, in its proportions and excellent finish, a work worthy of the age and style which gave us the glories of King's College Chapel, Cambridge, and Henry VII.'s Chapel, Westminister.

III.—In reviewing mediæval buildings another important class deserving special mention is formed by the extant remains of MILITARY ARCHITECTURE. While Wales as a whole lacks in magnificence of ecclesiastical architecture, it is in the same country that some of the very finest and grandest specimens of military architecture are to be found. The great castles of the Edwardian type at Conway, Rhuddlan, Carnarvon, and Harlech in the North, and at Pembroke, Kidwelly and Caerphilly in the South are well known. In Cardiganshire, or on its

border, are four fine castles of the kind, one at Aberystwyth, the other three at Newcastle Emlyn, Cilgerran and Cardigan along the line of the lower Teifi. All are very badly ruined, having been dismantled since the fighting which took place in or about them during the Great Rebellion in the seventeenth century. Other castles, of which records exist, have completely disappeared, like Gilbert de Clare's fortress at Ystrad Meurig, or their site may barely be traced, as at Lampeter.

(1) The castle at *Aberystwyth* arrests the attention of every visitor, for its ruins stand high on a rocky promontory washed by the sea. Its foundation is traced to Gilbert de Clare in the reign of Henry I. Many times the structure which stood here was captured and burnt: Owain Gwynedd is said to have destroyed it in 1142, Rhys ap Gruffydd in 1164 and Maelgwn in 1207. These earlier buildings were succeeded in 1277 by the fortress whose ruins may still be seen, which in its turn has gone through notable periods of strife, especially during the wars of Owen Glyndwr and when held by Thomas Bushel for King Charles I. At this last period royal permission was given to erect a mint within the castle and specimens of the coins are extant. The castle must have been of considerable size, but there remain only some dilapidated portions of walls and towers, in one of which is an arched gateway grooved for the portcullis.

(2) At *Newcastle Emlyn* the castle occupies the summit of a hill surrounded on three sides by the meandering Teifi. The New Castle which has given its name to the town was erected on the site of an earlier fortress by Sir Rhys ap Thomas in the reign of Henry VII. Like most of the Welsh strongholds it was held by the Royalists during the Cromwellian Rebellion; it fell into the hands of the Parliamentarians, but changed hands again after a great victory by General Gerard. Old inhabitants cherish the belief that Cromwell himself

visited the castle, and that an attempt was there made upon his life by Thomas Jones of Parcnest. The building has nearly all fallen into decay with the exception of an arched gateway about 14 feet high flanked by two octagonal towers.

(3) At *Cilgerran* the traveller is irresistibly reminded of the Rhineland. A few miles from its mouth the Teifi passes through a most romantic and picturesque gorge, and here the castle is magnificently placed on a bold and naked hill. The remaining structure consists chiefly of two round towers with parts of a gateway and curtain wall and fragments of massive bastions; it is said to date from 1223 and was held alternately by Welsh and English during a long period of continual strife.

(4) *Cardigan* castle ruins are now very meagre, consisting of little more than the remains of a bastion or two and some portions of wall. It stands by the river side near the bridge and was a fortresss of great strength and importance. Its foundation is attributed to Gilbert de Clare about 1160, but it seems to have been most often afterwards held by Welsh princes, and in 1135 was the scene of a sanguinary battle between the Welsh and the Anglo-Normans, in which the former were completely victorious, the English retreat being cut off by the collapse of the Teifi bridge, so that—

" The green sea brine of Teifi thickened. The blood of warriors
and the waves of ocean swelled its tide,
The red-stained seamew screamed with joy as it floated on a
surge of gore."

Held for a time by the Royalists under Charles I., the castle was after its capture by the Parliamentarians dismantled and ruined.

HISTORY OF ABERYSTWYTH

By Evan Evans.

The name Aberystwyth is derived from the River Ystwyth, and signifies the mouth or fall of the Ystwyth. The name is not strictly accurate having regard to the present situation of the town. Aberrheidol would be more correct, as the town now stands nearer to the River Rheidol than to the Ystwyth. The question has often been asked why the town derived its name from the Ystwyth. One suggestion is that the River Ystwyth at one time flowed nearer the town than it does at present. The course of the river has in fact changed more than once between Llanychaiarn Church and the Sea. Another suggestion is that an older town or village stood on the banks of the Ystwyth, some distance to the south of the present town. The name Aberystwyth is first found in authentic history in connection with a Castle, called Aberystwyth Castle, built opposite Llanbadarn by Gilbert Strongbow. When Henry I. ascended the Throne the whole of Cardiganshire was held by Cadwgan ab Bleddyn, a celebrated Welsh Prince, who refused to acknowledge the sovereignty of Henry. One day the King said to Gilbert, who was one of his followers: "You have often asked me for a parcel of land. Take the lands of Cadwgan ab Bleddyn." Gilbert experienced considerable difficulty in obtaining possession of the estate granted him by the Norman King, but after a great struggle with the Welsh prince, Gilbert proved victorious and established himself in possession. A greater difficulty yet remained, viz., to retain possession of the lands he had acquired. For that purpose Gilbert erected two fortresses, one in the lower part and the

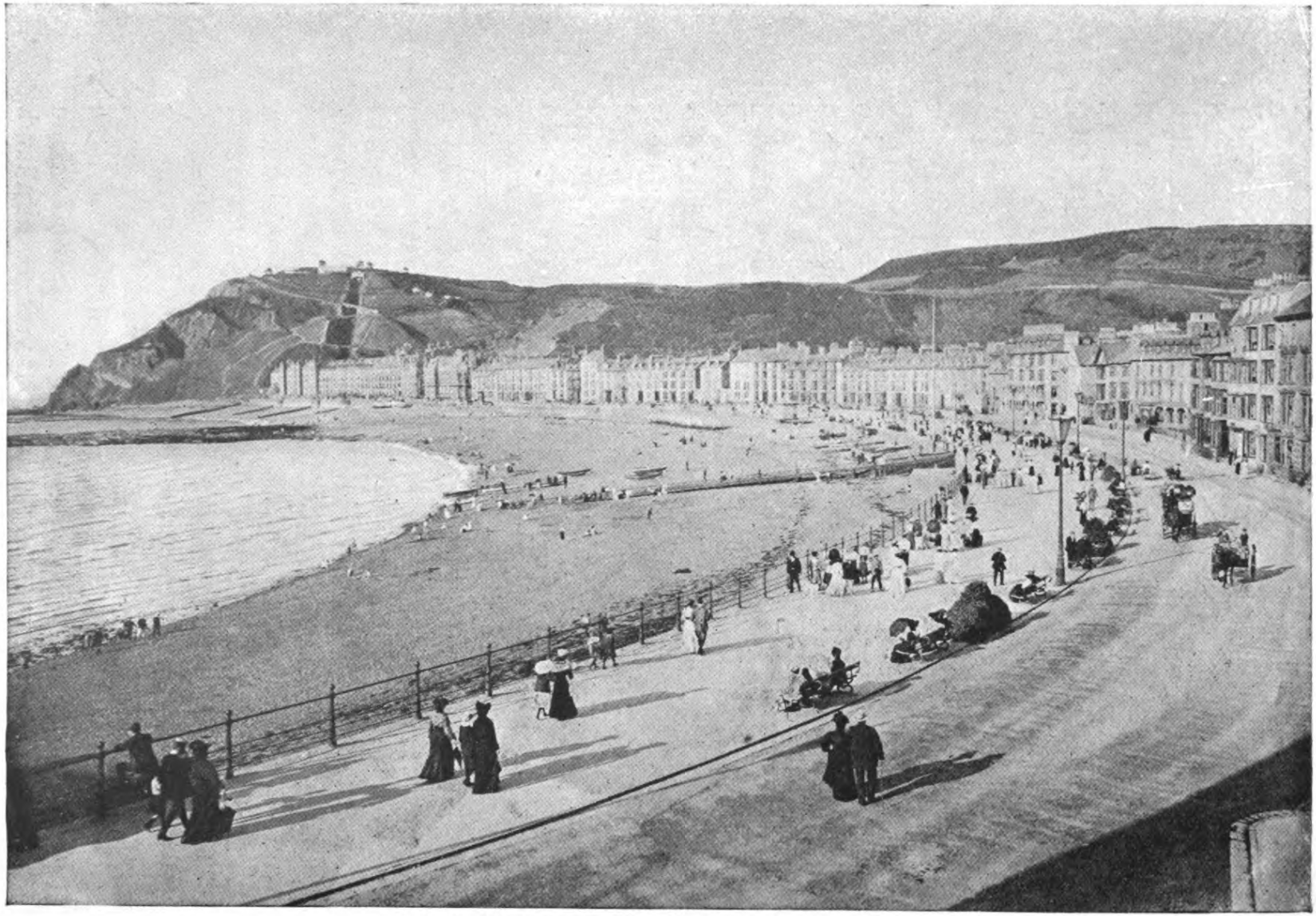
other in the upper part of the country. The latter, erected in the year 1109, was called Aberystwyth Castle. The history of this and the later castle is dealt with in another article. The first building in the town was the present Castle, erected by Edward I. in the year 1277. Edward succeeded in scattering the Welsh forces and in persuading the renowned Llewelyn to acknowledge his supremacy on certain conditions, and shortly afterwards, Edward erected several castles in Wales, among them the castle whose ruins we still possess. With its erection

CLIFF SCENERY. [*Photo, W. R. Hall.*

begins the history of Aberystwyth. Dwelling-houses were soon built in proximity to it by persons desiring shelter during the conflicts of that period. Before the death of Edward I. the houses were sufficiently numerous to be styled a village, and went under the name of Llanbadarn village. Edward directed that the village should be a town or a free borough. The Crown and the Crown alone had power to create towns and boroughs, to establish fairs and markets and to regulate the trade of the country. The word town means a number of

houses walled or fenced in, and under the first Charter, Edward commanded the village of Llanbadarn to be enclosed with walls and ditches. He also directed that two fairs be annually held within the walls, one at the feast of Pentecost and the other at the feast of St. Michael. He further established weekly markets on Monday, and conferred the right of trading with the consent of the burgesses. This Charter was confirmed by subsequent Charters. It was also extended by later Kings, who directed that all the buying and selling between the Rivers Aeron and Dovey should take place in Aberystwyth, and granted to the inhabitants the right of pasturage and of taking fuel from the lands adjoining the town. Under these Charters, Aberystwyth became a town or borough, having the name of Llanbadarn Gaerog, or fortified Llanbadarn. The word Gaerog was added to distinguish the town from Llanbadarn Fawr, a place of greater antiquity and fame. The land or township situate between Llanbadarn and Aberystwyth is still called Issa-yn-dre, *i.e.*, below the town, and the land or township on the other side of Llanbadarn Fawr, Ucha-yn-dre, or above the town, the town referred to being Llanbadarn Fawr, which had been a noted ecclesiastical foundation for generations, and was a town long before Aberystwyth came into existence. Notwithstanding that the town or borough was known as Llanbadarn Gaerog, the Castle retained its original name of Aberystwyth Castle. Eventually the town as well as the Castle became known as Aberystwyth. The walls were raised and the ditches dug soon after the date of the first Charter and continued for a period of at least 400 years. In 1760 certain parts of the walls which were then dangerous were ordered to be removed, but portions remained for a further period of 50 years. The wall extended in a circle or oblong around the town, extending from the Castle to Bridge Street, thence to

Great Darkgate Street and Baker Street, where it turned to the west, taking in part of Pier Street, and terminated at the Castle. The walls thus enclosed a small hill, which probably accounts for the selection of the site for the erection of the Castle and town walls. Usually, ancient towns possessed one principal street which extended the length of the space enclosed. That appears to have been the case with Aberystwyth. The first street was Great Darkgate Street, at the bottom of which a gate stood, called Darkgate, leading into the town. This street ran straight to the Castle. Two other gates were subsequently added, one of which stood at the bottom of Bridge Street, which is also an old street, and the other, a smaller gate, at the bottom of Little Darkgate Street. The town is thus divided into two parts, viz., that part within the old walls and the part outside, and the history of each is widely different from the other. The part within the enclosure is very old. The part outside is of recent date. The old part is freehold, and the recent, with a few unimportant exceptions, comprises houses built under leases granted by the Corporation. The oldest and most interesting building within the old town is the Castle. The Superintendent of the Castle exercised authority over the town as well as the Castle, his duties requiring him to preserve the claims of the King, and the rights of the English, as well as to ensure that the laws, made in the British Parliament, relating to the Welsh, were duly carried out. As instances of such laws it may be mentioned that no Welshman was permitted to hold any office under the Government. Marriages with the Welsh were prohibited to the English speaking portion of the population under penalty of forfeiting their lands and property to the Crown. Deeds and agreements were not allowed to be written in the Welsh language. Four years was the limit within which the Welsh were allowed to purchase or hire land.



MARINE PROMENADE, ABERYSTWYTH—LOOKING NORTH.

The town was responsible for all offences committed within its walls, and the Welsh were not allowed to have a voice in detecting the offender if he spoke the English language. Such are a few instances of the laws enacted for Wales, and they account for the attempts of Owen Glyndwr, a descendant of the Welsh Princes, for the last time to restore once again their authority over their country. The growth of the town for the first 500 years was slow. A map made at the beginning of the last century shows the following streets, Great

A Morning Ride.

Darkgate Street, Pier Street, then called Weeg Street, and Bridge Street, with their complement of houses; and the following streets partially filled with houses, Rosemary Lane, now Princess Street, Barker Lane, now Queen Street, Back Lane, now Gray's Inn Lane, Mill Street and High Street. A few houses stood in the upper part of the Marine Terrace, then called the Weeg. The Custom House occupied a site near the Promenade Pier and a wide stone pier projected into the sea opposite the College. Altogether the houses numbered less than

350. The whole was freehold and owned principally by three persons, the then owners of the Gogerddan, Nanteos and Fronfraith estates. The principal road from the town was on the north, leading to Machynlleth, in the position of North Parade. From the date of the Charters to the present time the Crown has claimed certain rents and tolls in respect of the town. One of the most important privileges granted under the Charters was the right of holding fairs and markets and of trading within the walls, but in granting them, it was stipulated that tolls should be paid to the Crown. The amount was ultimately settled at £1, which has ever since been continually exacted. Aberystwyth has always been noted for herring fishing, and for the privilege of landing and selling fish in the town, the rights of the Crown had to be acknowledged. The original arrangement was to render five score of herrings for the privilege. This was afterwards commuted into an annual payment of £1 10s. A member of the Pryse family held a lease of this Crown right, subject to the annual payment of £1 10s., and the privilege was long known as the Pryse, or Castle, Maes of Herrings. Afterwards a member of the Nanteos family obtained a lease of the right, and twenty years ago there were persons living who remembered the first haul of herrings caught in the bay each year, being sent to Nanteos. Several other payments were demanded by the Crown, some of which still continue. The old Mill is an instance. It is not now known when corn was first ground in the town, but the question was raised by the Crown whether the inhabitants possessed the right to grind without the consent of the Crown officials and payment of a toll. In 1573 an important trial took place at Hereford, between the Queen and the inhabitants of Aberystwyth, in which the Crown succeeded in establishing its right to the Mill. Since then it was called "Our Lady's Mill" or "The Mill of our Lady Queen

Elizabeth." Thirteen years after the lawsuit the Crown leased the Mill with all its rights to a member of the Pryse family, for 40 years, at the annual rent of £3. This transaction was the first of the many ties between the Gogerddan family and the town. After the lease, Mr. Pryse's consent had to be obtained for grinding at the Mill, and the tolls were paid to him. Subsequently, the Crown disposed of the Mill to Mr. Pryse and his heirs for ever, subject to the annual payment of £3. In 1743 fresh trouble arose concerning the Mill in consequence of some inhabitants taking corn to mills outside the town. An action was commenced to determine the question whether grinding elsewhere was an infringement of the rights attached to "Our Lady's Mill." The difficulty was removed by the Corporation granting a plot of land for the purpose of enlarging the mill and making it sufficient to meet the requirements of the town.

The right of electing representatives to Parliament was granted to Welsh counties and boroughs in 1537, but the burgesses of Aberystwyth had no choice in the first elections. Cardigan, as the county town, alone possessed the right to elect, notwithstanding that the inhabitants of Aberystwyth contributed to the salary paid to the member. Shortly afterwards, the right of election was granted to all boroughs which contributed to the remuneration of the member. The influence of Aberystwyth was first manifested in the election which took place in 1601 when two members were returned, one as the choice of Aberystwyth, and the other of Cardigan. The member elected at Aberystwyth was Dr. William Awbrey, who is described as a distinguished member of Oxford University, a Doctor of Laws, an Advocate in the Court of Arches, a Master in Chancery, and a member of the Council of Marches. The double return was discussed in the House of Commons and a Committee was

A Dash of Spray, Aberystwyth [*Photo, W. R. Hall.*

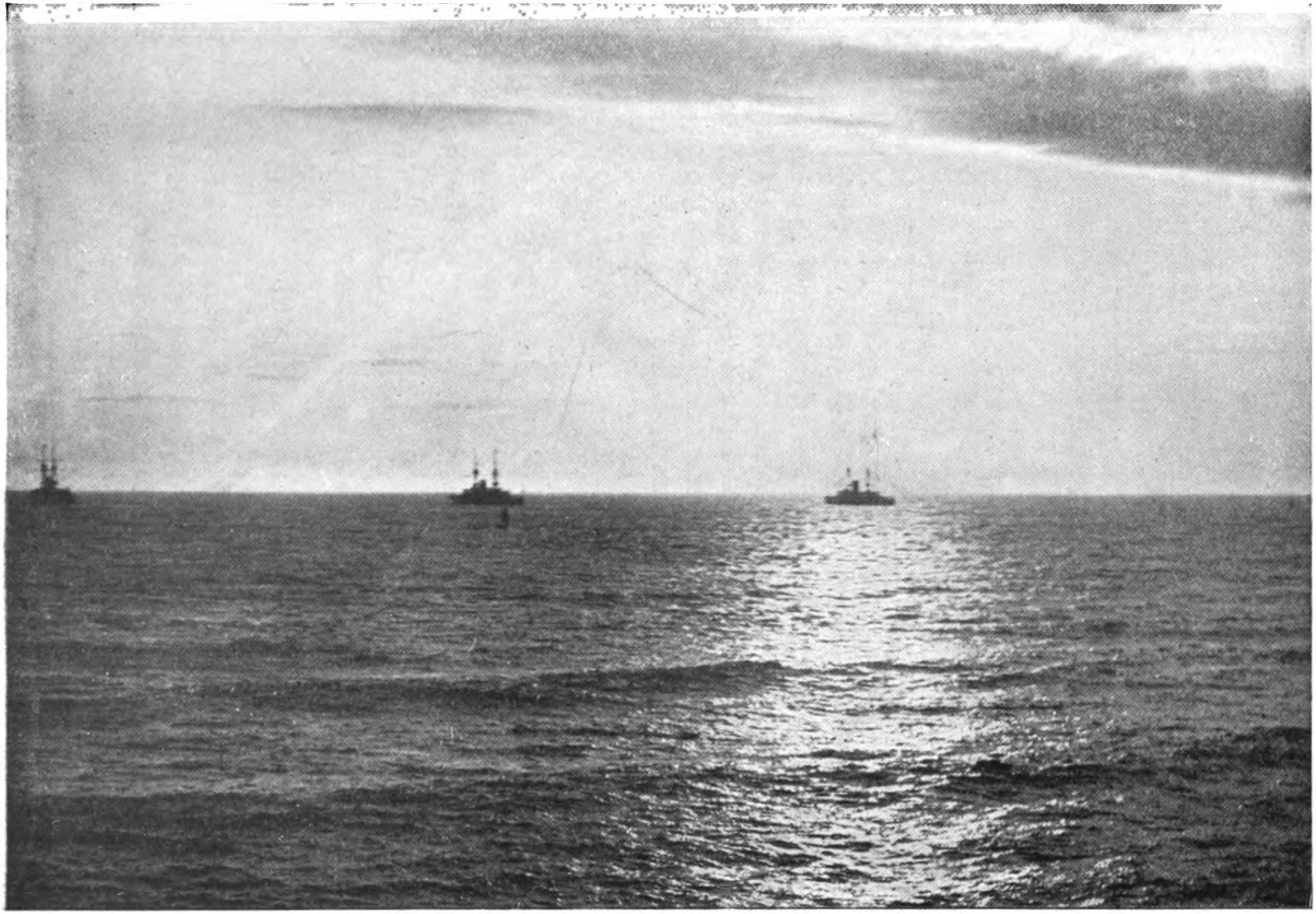
appointed to inquire into the election. It was proved before the Committee that the Sheriff for the County on the receipt of the Queen's Writ, directed the Mayor of Aberystwyth to proceed to an election of a member for the burgesses. During the election the officials of Cardigan became aware of the writ, and a number of the Cardigan burgesses appeared in Aberystwyth for the purpose of supporting their candidate. Having failed in their object, they returned home, and without any communication from the Sheriff proceeded to return their choice, Mr. Williams, Deleban. The decision of the Committee which conducted the inquiry is not recorded. In the next election, which occurred in 1603, a similar result occurred, Aberystwyth returned one member and Cardigan another. A Committee was again appointed by the House of Commons, who held an inquiry and decided in favour of the Cardigan return. The influence of Aberystwyth has always predominated in the elections for the boroughs. In 1640 a member from this neighbourhood was for the first time elected, viz., John Vaughan, of Trawscoed, afterwards Chief Justice of the Court of Common Pleas, an eminent lawyer and an eloquent advocate. He also took a prominent part with the Parliament forces in taking Aberystwyth Castle in 1647. In the year 1741, a member of the Pryse family was elected, and a member or a friend of that family continued until 1868 to represent the Cardigan Boroughs in Parliament, owing to the influence possessed by the Aberystwyth burgesses in the elections.

From the date of the charters down to the year 1834, the affairs of the town were governed by the Court Leet, which is an ancient court of record, held within a particular district or manor before the steward of the Leet. Court Leets are still held in many parts of the country. Their original intent was to view the frank

pledges of the freemen within the liberty who had given mutual pledges for the good behaviour of each other. Besides this, they possessed jurisdiction for the preservation of the peace, and the chastisement of minute offences against the public good. In corporations the mayors acted as stewards of the Leet, or presiding judges. There are many peculiar customs connected with the holding of these courts. In a corporation not far from Aberystwyth, an old custom has existed from time immemorial for every newly admitted burgess to quaff

LAUNCHING THE LIFEBOAT. [*Photo, James T. Ede.*

at one draught a hornful of ale, as a token that he is admitted into their society, and an old ox horn was carefully preserved for that purpose. Latterly, to meet the scruples of total abstainers, the custom was modified by allowing them to drink, instead of ale, the same quantity of water. That practice did not prevail in the gatherings of the Aberystwyth Leet, although there were attached to them usages which the present generation would regard as unnecessary. The court was held twice a year, in May and October. The practice of holding



SUNSET ACROSS THE BAY, ABERYSTWYTH. WAR VESSELS IN THE OFFING.

the court appears to have been as follows: The mayor issued his writ to the bailiffs requiring them to summon a number of qualified jurors, usually twenty-four, to meet at the Town Hall on the day appointed for holding the court, and also to proclaim the court throughout the town. The jurors, on the assembling of the court, were sworn to inquire honestly into all matters given to their charge, and to make true presentments according to the information brought before them. In the October court the officers were annually appointed, consisting of the mayor, coroner, bailiffs, constables, sergeants, scavengers, ranger, and latterly, recorder and town clerk. The first business of the court was to admit new burgesses. All the inhabitants were not burgesses and many burgesses were not inhabitants. Every burgess on admission took an oath to serve the King and the inhabitants of the town, to minister equal justice to the poor and rich, and to keep all orders for the good government of the town. Complaints were often made before the Court Leets against persons for removing stones from the Castle Ruins. The walls surrounding the town and the gates were also often mentioned at the Leet, the jurors presenting that they were out of repair and requesting the authorities to repair them. The trade of the town was also under the control of the court, and great care was shown that no person traded within the limits without the consent of the burgesses. In 1739 it was discovered that one Henry Hodgins had started the business of barber and wigmaker without obtaining the necessary consent. At the next court a complaint was lodged against him, and the jurors made the following presentment: "We present Henry Hodgins for exercising the trade and mistery of a periwigmaker and barber in the town and liberties without being a burgess or freeman." The word "mistery" is probably intended for mastery, although there would also be some mystery as

well as mastery connected with the trade of a barber and wigmaker in the opinion of many inhabitants of the town 170 years ago. The House of Correction has always been at the bottom of Great Darkgate Street, on or near the site of the present police station. For minor offences a whipping post was provided, and stocks adjoining the old Town Hall, on the site of the present clock tower, for the repair of which the Court Leet was responsible. There was formerly another form of punishment called the ducking stool, which was a stool or chair in which common scolds were tied and plunged into water. Aberystwyth never possessed a ducking stool, but on several occasions the jurors presented that one ought to be provided. In 1750, one Elizabeth Lloyd was declared to be a common scold. Ten years later the jury presented Mary King to be a common scold, and disturber of the peace, and further presented that a ducking stool ought to be provided for the due punishment of any disturber of the peace within the limits of the town. The power of admitting burgesses was exercised very freely, and every year persons residing outside the town were admitted to enjoy those privileges. All the principal landlords of the county thus became burgesses, as well as many clergymen and persons of position from the counties of Montgomery, Merioneth, Denbigh, Salop and Bucks. Occasionally, large numbers were admitted together. In 1740, 140 burgesses were admitted, all of whom were non-residents, principally tenant farmers residing between Aberystwyth and Machynlleth. The object of their admission is plain, for in the following year an election occurred, when Mr. Pryse of Gogerddan was returned. In 1756, 250 burgesses were admitted together, and large numbers in subsequent years, in anticipation, as a rule, of a parliamentary election. The commissioners who inquired into the proceedings of ancient corporations, which resulted in

the passing of the Municipal Corporation Act, 1834, reported in regard to Aberystwyth Corporation that the large majority of its burgesses were non-resident. One hundred years ago or thereabouts, the Court Leet adopted a new course, namely, to grant parts of the common or waste lands of the Corporation for building purposes. The reason for this was the influx of visitors to the town during the summer months, from the counties of Hereford

A Centenarian.

and Salop, and also because of expensive litigation between Mr. Powell, of Nanteos, and the Corporation. An ancestor of the Powell family had purchased, upwards of two centuries ago, the rights of the Crown in the town and liberties, and in the year 1724 a conflict occurred between the then owner of the Nanteos estate and the inhabitants, the owner claiming the right of holding the Court Leet within the town, admitting burgesses, and

CWM WOODS, ABERYSTWYTH. [*Photo, W. R. Hall.*

appointing the mayor and other officials. The Corporation disputed his title and continued to exercise similar rights. Litigation ensued, in which the appointment of Mayor by the court held by the steward of the Nanteos estate was set aside. After an interval of eighty years, when the town began to extend beyond the ancient walls, a fresh claim was put forward by the Powell family to parts of the common or waste land. This again was the subject of litigation, and to discharge the costs incurred in defending the title of the Corporation, part of the Dinas was sold and grants of different plots made for building. A large tract of marsh land was improved and protected from the river Rheidol, and let in plots on leases under which considerable rents were reserved. In the year 1834 the Court Leet was superseded by the town council, since which date the property of the town has been managed by the mayor, aldermen and councillors elected by the burgesses. For some centuries the inhabitants attended the Church at Llanbadarn as their place of worship, and one of the wings of that Church was allotted to them, until a Church was erected on the rabbit warren between the Castle point and the old pier. It is uncertain when that church was built, but it stood in the time of Elizabeth, for in granting the lease of the Lady's Mill to Mr. John Pryse, already mentioned, one of the conditions of the lease was that the lessee should provide Divine Service in the Chapel of Aberystwyth. St. Mary's Church, with its Churchyard, was swept away by the sea, and another was erected in the present churchyard opposite the entrance gates in Great Darkgate Street in the year 1758. In one of the Leets for that year, the jury made the following presentment: "We present Mr. Walter Jones for not subscribing towards building a chapel in the town in the room of St. Mary's Church destroyed by the sea." No reason is given for the refusal of Mr. Walter

Jones to subscribe, but the presentment shows that a strong feeling prevailed in the town on the question of subscribing, and that very few burgesses declined to help in the erection of the new Church. The church erected in 1758 was superseded by a larger church, St. Michael's, erected in 1825, and this has since been replaced by the present church in Laura Place.

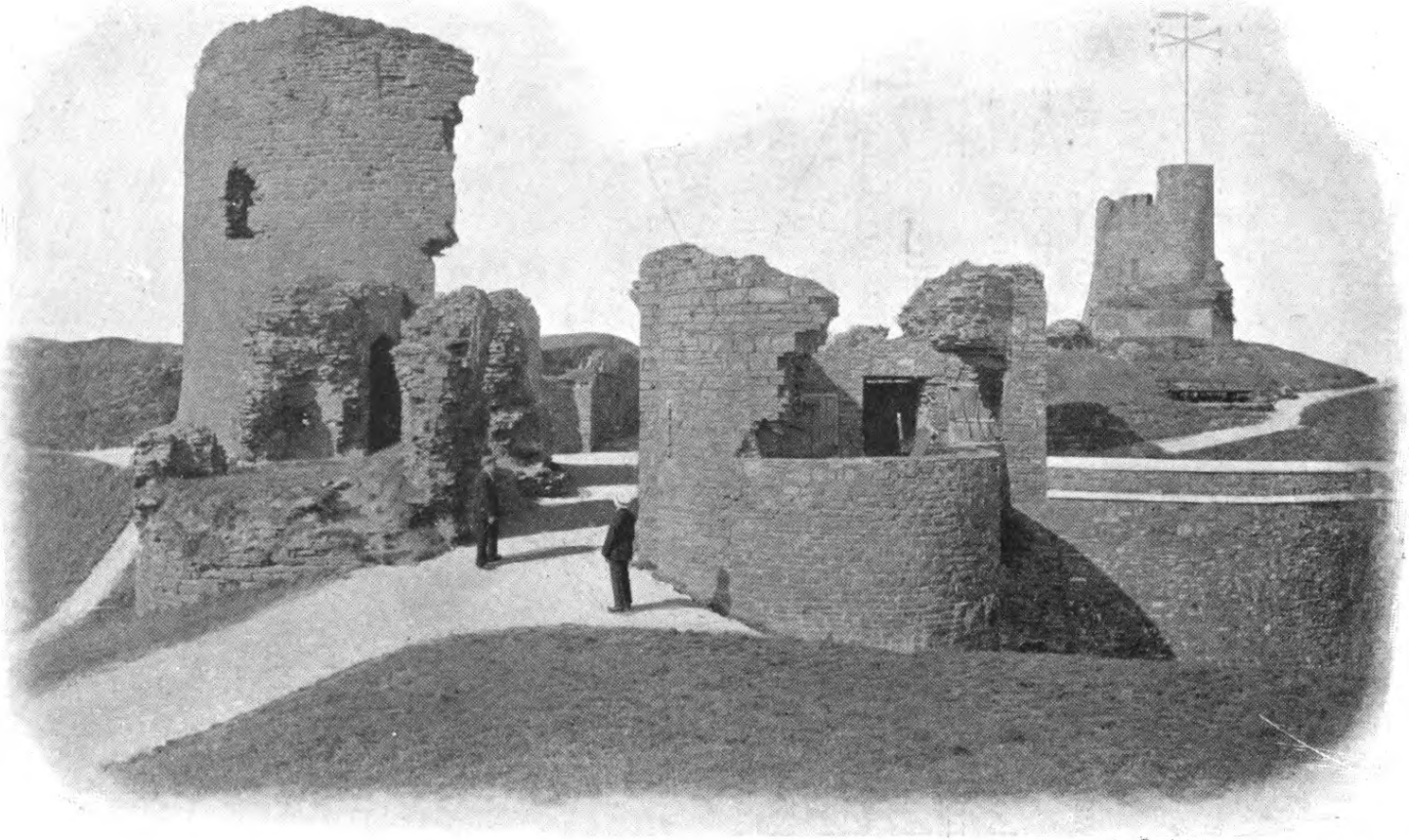
Nonconformity started about 130 years ago. It began by occasional meetings being held in private houses. In 1784 the Calvinistic Methodists held their first Association in Penmaesglas, and in the following year the first Tabernacle Chapel was built in Mill Street. The Baptist body was next planted in the town, and the Wesleyans and Independents followed. With the extension of the town during the past 120 years, there has been a corresponding progress in other directions. The recent history is a record of advance in population, commerce, education, morals and religion.

THE CASTLE OF ABERYSTWYTH

By E. A. Lewis, D.Sc., M.A., Lecturer in History in the University College of Wales

Aberystwyth was noted for its Castle and its herrings quite seven hundred years before there was any talk of its College, its National Library, its Town Council, and its Promenade! The old castle, whose majestic ruins—proud even to-day in the hour of their decay, is the most important of our local links with the remote past, and enjoyed the heyday of its prosperity centuries before Aberystwyth ever dreamt of making any strides in the direction of such classic titles as "the Queen of Welsh Resorts," and "the Athens of Modern Wales." The life-story of the castle in point of historical interest and thrilling episode, rivals that of many of our Welsh castles, and has been retold over and over again; its oldest and doubtless best, historians, have been two prominent townsmen of some generations ago, namely, the late Mr. Thomas Owen Morgan, at one time Mayor of the borough, and the late Mr. John Hughes, of Lluest, uncle of the present town clerk.

Like the majority of Welsh castles, of which there are stone remains standing to-day, our local castle traces its origin to the period of the Norman or English conquest of Wales. It played an important part in the long and involved chain of events which led to the subjugation of North Ceredigion—a district, roughly speaking, extending from the river Aeron to the estuary



THE CASTLE OF ABERYSTWYTH [*Photo, W. R. Hall.*

of the Dovey. The earliest authentic notice to the castle appears in by no means the most trustworthy copy of the Welsh Bruts. Under the year 1109 we read that Gilbert Strongbow, the first Norman and Clare lord of Ceredigion, established a fortress upon the top of a hill that shelved down to the river Ystwyth. This event marked Gilbert's earliest attempt to consolidate his hold over the extensive district of Cardigan, which was granted to him by Henry I., owing to the disloyalty of the native chieftain, Cadwgan ap Bleddyn. Strongbow's castle, it is clear from the above description, did not occupy the site whereon the present ruins stand, but rather the crest of the hill situated a little further south above the modern farm of Tanycastell, as a local archæologist, the Rev. George Eyre Evans, has recently pointed out. The castle of Aberystwyth which flourished on this site was a Norman fortress of the stockade type common to Ceredigion, and like its compeers at Castell Gwallter, Ystradmeurig, and Dinerth underwent varying vicissitudes during the earlier half of the twelfth century. The last is apparently heard of Aberystwyth Castle on the Strongbow site in 1143, when Owen Gwynedd, the powerful prince of North Wales, intervening in a domestic squabble that was going on in North Ceredigion, after committing considerable waste and destruction, burnt the castle to the ground.

The latter half of the twelfth century was a period of reaction in the story of the Norman Conquest of Wales. For the nonce there was a boom in Welsh things, and Norman pressure for some very good reasons relaxed. True to the character of the times feudal self-interest rather than the national weal counted for most with the Welsh chieftains, particularly in West Wales, where the consolidating work of the Gwyneddian princes never took a firm hold. Ceredigion thus became a

fruitful ground for intrigue and internecine warfare, and its castles were mere pawns in the fierce kite-and-crow struggle that was carried on between the rival descendants of the House of Dynevor. The native chroniclers, with good taste, have spared us the gruesome details, but in 1163 the Brut curtly narrates that Prince Rhys (later the great Lord Rhys), after expending much of his energy in the interests of local unity, took Aber-Rheidol Castle from his rebellious sons and razed it to the ground. With the death of Lord Rhys in 1197 the forces of disorder again obtained. Griffith and Maelgwn, two sons of the deceased prince, almost immediately entered upon a prolonged duel in which the district of North Ceredigion was the chiefest prize. Griffith secured first possession, and strengthened his position by erecting a fortress, called Aberystwyth, seemingly upon the site of the Castle of Aber-Rheidol which was destroyed in 1163. Griffith held his own for some time, and under the tutelage of his castle, some sort of a town of Aberystwyth began to flourish. At length, he was ousted by his brother Maelgwn, who received substantial support from Gwenwynwyn, the paramount prince of Powys. Maelgwn maintained his hold over the district for some years, but in 1206, in order to disarm Llewelyn ap Iorwerth, who was then on the point of entering Ceredigion on Griffith's behalf, he wilfully destroyed several of his local castles, among others that of Aberystwyth. This rash action facilitated Llewelyn's approach, and upon his arrival at Aberystwyth he found the place in a hub of excitement over a wonderful catch of herrings which had providentially fallen to the lot of the local fishermen. The Strata Florida chronicler avers that God had never bestowed such an abundance of fish before. The great North Welsh Prince immediately restored the castle in conformity with the general plan of

opposition which he proposed to offer to the organised attack which King John, with the connivance of Maelgwn and other Welsh princes, was about to make upon Wales.

The thirteenth century saw the consummation of the political conquest of Ceredigion. Where the Marcher Lords failed, the Plantagenets succeeded. The royal conquest, however, proceeded according to the Strongbow plan of the previous century. Aberystwyth was to form the nucleus of royal power in the district north of the Aeron, as was Cardigan in the land between the Aeron and the Teivi. By 1210, following the initial collapse of Llewelyn's national scheme, Foulke de Breauté, King John's fond favourite and cruel agent, established a castle *for the King* at Aberystwyth. Alas! the life-span of the first royal castle at Aberystwyth was destined to be a short one. The finishing touch had hardly been put, when Prince Maelgwn suddenly repented his obsequiousness to the English king, and gave immediate vent to his indignation by demolishing the *new castle* to the ground. Another structure was subsequently raised on the same site, which, during the long and troublous reign of Henry III., was for the most part in the hands of local chieftains claiming direct descent from the Princes of Dynevor. The latter at some intervals rendered homage to Llewelyn the Great. Whilst northern Ceredigion and its castle thus remained in Welsh hands, in the meantime, southern Ceredigion, particularly the district around Cardigan, was securely held by royal bailiffs in the English interest. With the advance of the century, however, the Welsh autonomy of North Ceredigion was more and more threatened. The break-up of the national confederacy of Welsh princes on the death of Llewelyn the Great in 1240 gave it a rude shock; the grant of the districts of Cardigan and Carmarthen to Prince Edward in 1254 was a sure sign that

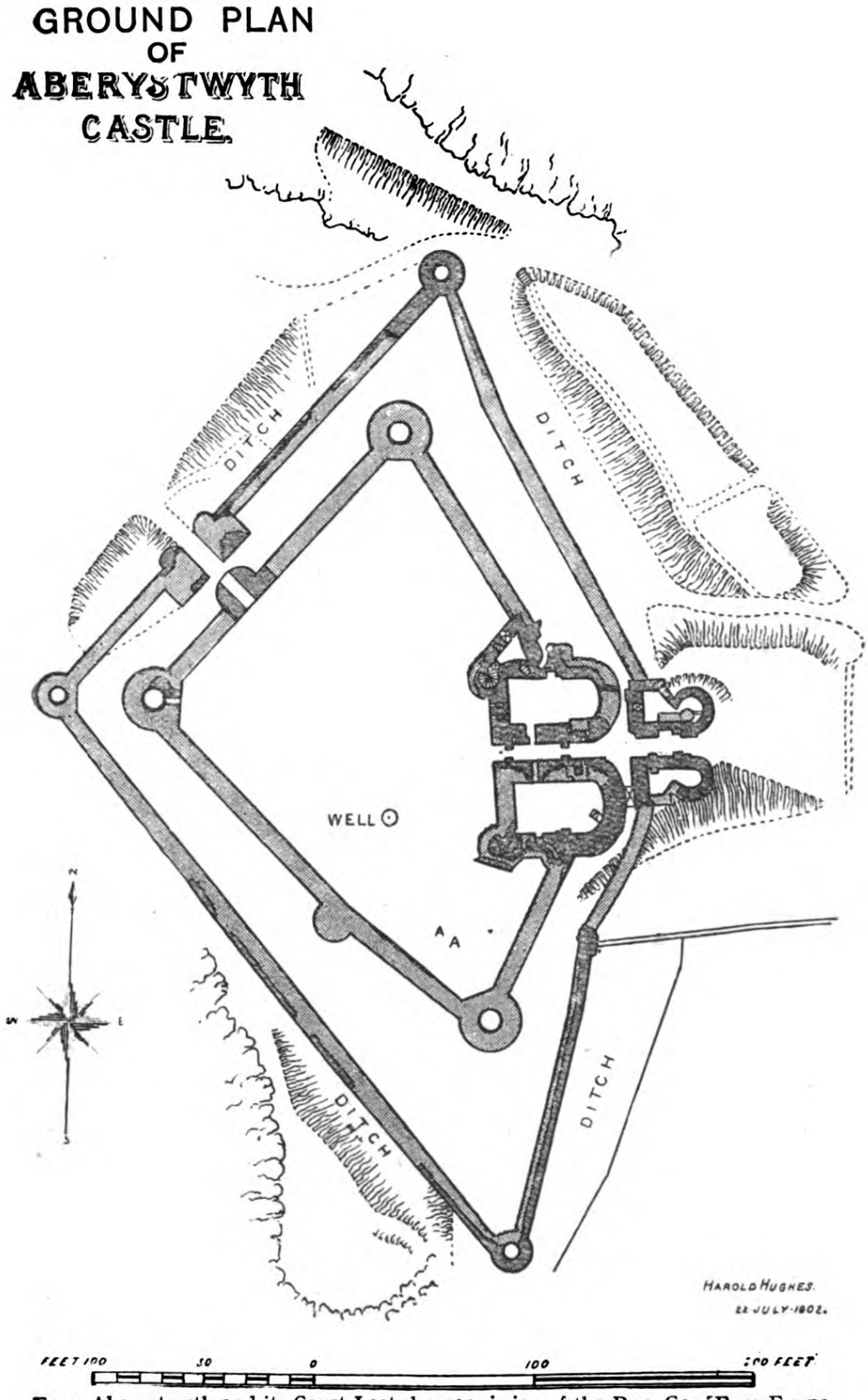
the impending storm was imminent ; the calamity itself arrived as the result of King Edward's resolute determination in 1277 to finally conquer Wales. Whilst Edward I. and his army were prosecuting their 1277 campaign in North Wales, Edmund of Lancaster and his forces, working from Carmarthen as their base, closed in upon Ceredigion from the south. So successful were their efforts, that by the feast of St. James the Apostle, 1277, they reached Llanbadarn, and, according to the contemporary English and Welsh chroniclers, began to erect a *noble castle* (called *noble* perhaps in contradistinction to the flimsy structure which it was intended to incorporate or supersede) at Aberystwyth. At the same time the Pipe and Patent Rolls inform us that upwards of £200 were expended upon the walling of the town, and extensive trading privileges were for the first time granted to the burgesses—mostly *advenæ*—so as to make them useful auxiliaries in solving the grave problem of the victualling of the troops. From this date the English Crown never permanently lost its hold of the castle, town, and neighbourhood of Aberystwyth, but during the later Welsh rising of 1282–3, which resulted in the fall of Llewelyn ein Llyw Ola', the Welsh chieftains of the district and their followers damaged the local fortifications considerably.

Operations upon the castle were renewed immediately the turmoil attending the downfall of Llewelyn had subsided. It is the ruin of the castle then erected which is visible to-day. In matter of style and structural detail it belongs to the well-known Edwardian type of fortress, many of which were at the same time erected elsewhere in the Principality. Like Carnarvon Aberystwyth is a concentric castle, modified in certain points of detail by the natural site upon which it is situate, and as is the case with the Edwardian castles at Builth and Harlech, it apparently incorporated an

earlier fortress (or fortresses) within its precincts. The original extent and structure are only scantily revealed by the present ruins, but the salient features are indicated in the following official ground-plan compiled some years ago by Mr. Harold Hughes, F.R.I.B.A., and which, through the kind permission of the Rev. George Eyre Evans, we are able to reproduce.

Local materials were largely utilised in its erection. A goodly supply of excellent stone was obtained from the adjoining cliff, and the ranges of Plynlimmon (whose vast mineral wealth had been alluded to by Gerald the Welshman about a century before this) yielded some lead for the purposes of the roof. Several of the master artisans, and some of the building requisites came from Bristol. The fighting strength of the castle may be inferred from the ground-plan and from some of the existing ruins, for instance, the extraordinary thickness of the walls. Naturally protected at many points, and favoured with an ample supply of water within its precincts, the castle, militarily speaking, was a very strong one. Adequately garrisoned, and with the co-operation of a field army in the outlying districts and a fleet in the over-looking bay, it was well-nigh impregnable.

Edward I. paid a personal visit to the castle during the course of its erection. That he intended it to be something more than a mere military fortress is evident from the elaborate King's Hall and Queen's Hall which he had established therein. The castle also included several chambers for the purpose of carrying on the administration of North Ceredigion on the lines laid down in the celebrated Statute of Rhuddlan. For example, prisoners drawn from the district between the Aeron and the Dovey were to be kept in the dungeon of the castle, and it was within or near the castle that the more important of the new-fangled courts were to be holden. In this



From Aberystwyth and its Court Leet, by permission of the Rev. Geo. Eyre Evans.

way, much of the routine life of North Cardiganshire revolved around the castle during the later Middle Ages.

Edward I., moreover, fully alive to the important function of his new castle, made careful provision to secure the sustenance of its garrison. Extensive meadows, near at hand, at Plascrug, and farther away in the Vale of Clarach, were allocated to the use of the castle men, and the bondmen of the neighbourhood were enjoined to perform carriage and harvest service in their behalf. On the whole the Welsh bondmen performed their irksome duties with grace, but occasionally they proved obdurate, and the castle crops in consequence were often washed away by the sea. Furthermore, the constable of the castle enjoyed the right of pre-emption over all the saleable articles brought to the local market, thus butter, eggs, beef and poultry from North Cardiganshire were drafted every Monday, at a nominal price, into the castle larder. The latter, too, was periodically replenished with such luxuries as English corn, Bristol beans, Irish hake, and *vin rouge* from Gascony. The armoury of the castle was stocked with military equipment, as occasion required, from the head-armoury of the South-Welsh Principality, stationed at Carmarthen; several inventories giving an exact catalogue of the weapons of war kept in the castle still exist in manuscript. The Master-of-Arms for the district of South Wales, paid periodic visits to the castle for the purpose of inspecting its military efficiency. He was generally accompanied by the Master-Mason and the Master-Carpenter who reported and advised upon the structural alterations and repairs that were necessary from time to time. Some of the extant operation accounts are exceptionally interesting, inasmuch as they reveal several structural features of the castle hardly indicated by the present ruins and throw significant light upon the economic condition of Aberystwyth

artisans centuries ago. Apparently no serious and extensive reparations were done to the castle beyond the middle of the fifteenth century.

The castle was placed under the control of a constable, appointed by the Crown, generally for term of life at a yearly stipend. Among its long list of constables are included several notables, to mention only Sir John de Skidemore and Sir Rhys ap Thomas. Throughout the fourteenth and fifteenth centuries the constable was supported by a small garrison of fighting men ranging from eight to twelve in number. The latter, along with the chaplain of the castle chapel, and the domestic staff, made up the full complement of the castle population, perhaps about a round score all told. The little band, however, always reckoned upon the support of the inhabitants of the adjoining borough which grew up under its protection. At the commencement of the fourteenth century the local burgesses were about 100 strong, but the Black Death nearly halved their numbers. The castle and town had hardly recovered from the devastations of the Great Pestilence, before they had to undergo equally severe treatment at the hands of Owen Glyndwr. For some three years Owen and his forces occupied the castle and town. Owen took up his residence in the castle, and from here dated his remarkable letter to the King of France, soliciting his aid against their common enemy, Henry IV. The castle and town were not restored to English hands until after considerable damage had been done, and from which the castle never entirely recovered. From the Edwardian conquest to this time the castle was officially known as Llanbadarn, but during and after Glyndwr's revolt, it, together with the town adjoining, was denominated Aberystwyth. In 1415 Henry V. placed four of the many French prisoners captured in the Battle of Agincourt in the custody of the local constable.

The foregoing episode in connection with the revolt of Glyndwr, is the only recorded lapse in the fidelity of the local castle and town in the performance of the solemn function vouchsafed to them by Edward I., namely, the maintaining of law and order in North Cardigan, until the Welsh populace became reconciled to the political domination of England. The peculiar disease of the men of Ceredigion, as of Wales, during the heyday period of our local castle, say the fourteenth and fifteenth centuries, was their " tendency to rebel " or as the English mediaeval clerks term it " lightness of head," a virtue, by the way, which they attribute to all members of the Celtic fringe during the later Middle Ages. In Wales, particularly in the bardic circles, there was quite a craze for Home Rule, or as mediaeval Welshmen often expressed it in their petitions, a longing " to be ruled again by a prince of their own kith and kin "—in short, the fulfilment of Merlin's prophecy was to them at this time tantamount to the " end of all things." So long as such political aspirations thrived, and threatened to assume practical shape, Aberystwyth Castle *qua* castle had a legitimate and practical function to perform in North Cardiganshire. The accession of Henry Tudor, however, to the English throne in 1485 wrought a change in the political atmosphere of Wales, and castles, as such, gradually lost their prime significance in Welsh history. True, constables of castles continued to be elected, and drew the accustomed fees for a specified number of soldiers, but only a small percentage of the Welsh castles were actually garrisoned during the Tudor period, and that for general administrative rather than purely military objects. After the Act of Union of 1536 the castle of Aberystwyth, like other Welsh castles, was deprived even of much of its purely administrative importance, and practically lost all contact with the everyday life of the district. It

soon ceased to be inhabited, and even as early as the days of John Leland, it had become an object of antiquarian interest. It was temporarily resuscitated, like many other unused British strongholds, during the Great Civil War to make some little show on behalf of the King's cause. The majority of the surrounding populace, by this time, appear to have substituted newfangled parliamentary ideas for their old-time prophetical turn of mind, but the royal garrison of the local castle, as its precursors in the days of yore, offered stout resistance and died fighting. Thirteen of their number, whilst attempting to surprise a motley group of Parliamentarians stationed in Llanbadarn, lost their lives in a mill-pond near the town. Ultimately, the Royalist forces were overpowered, and the castle was dismantled in the usual Cromwellian fashion. Fragments of the cannon which wrought the damage are now carefully deposited in a glass case in the Town Library.

For some time previous to the outbreak of the Civil War, Aberystwyth made gradual progress from the impoverished condition in which it found itself in the days of Queen Elizabeth, mainly because of the exploitation on commercial lines of the rich silver and lead mines of Cardiganshire. This mining boom of the seventeenth century developed the local harbour, and incidentally affected the castle. So immense were the profits of the Cardigan mines, that Charles I., in 1637, for a money consideration, allowed his friend, Sir Thomas Bushell, to erect a mint within the castle of Aberystwyth for the purpose of coining such bullion as should be drawn from the mines of the Principality. Extant specimens of the coins actually struck within the castle are now rare, but some may be seen in the local Museum of the University College of Wales. Unfortunately for the castle, the mint, in 1642, was removed to Oxford.

After the rough treatment meted out to it by the

Parliamentary forces in 1649, the castle, along with a large number of its Welsh fellows, fell a victim to the vandalism of the late seventeenth and following centuries and provided a useful quarry for building stone to some of the more prominent townsmen. The old Leet Court of the borough, conscious perhaps of the useful protection which the castle had rendered to the borough at an earlier period, protested vigorously on many occasions against the undermining of the castle walls, but in vain. It was not until the foundation of the Cambrian Archæological Society, which held its first annual meeting in Aberystwyth in 1845, that a full stop was put to the disestablishment of the castle. Some thirty years ago the Corporation of Aberystwyth secured full rights over the castle ruins, and it is to the loving care of this body that it owes its present state of preservation.

The Middle Ages die hard! For pure visitorial interest Aberystwyth to-day, next to its bracing sea-breeze and stimulating mountain air, possesses no more valuable asset than its stolid masses of masonry, situated, to translate the words of a fourteenth century clerk: "on a perilous rock near the sea!"

ABERYSTWYTH AS A HEALTH RESORT

By ABRAHAM THOMAS, M.B., B.S. (Lond.), Medical Officer of Health for Aberystwyth

ABERYSTWYTH enjoys a well approved reputation as a health resort. Its popularity in this respect depends upon the possession of natural advantages of situation and climate such as few watering places can offer. Standing near the centre of the coast-line of Cardigan Bay it receives the full benefit of the westerly breezes blowing across the open sea. Behind the bay the land rises to the high moors and mountains which go to form the sparsely populated region of Central Wales. The land breezes reach Aberystwyth fresh and pure from their passage across these uplands. The blending of the sea and mountain breezes imparts to the air of Aberystwyth a rare tonic quality which speedily dissipates all feelings of lassitude and debility. The climate is at all seasons most invigorating. Oppressive heat in summer and depressing foggy weather in winter are alike unknown. Indeed, the most noteworthy feature of the climate of Aberystwyth—one that has not hitherto obtained sufficient recognition—is its equability. The range of variation in temperature throughout the whole year disclosed by the official records taken for the Meteorological Society is surprisingly small. The average diurnal range of temperature for the last ten years does not exceed 10°. The climatic conditions thus indicated make Aberystwyth not only a delightful holiday resort in the summer months, but also a

desirable place of residence in winter for those whom an equable yet invigorating climate is essential for the preservation of good health. The mildness of the winter climate and the almost complete freedom from frost and snow is to be attributed to the influence of the Gulf Stream on the temperature of the western coast. Moreover, the prevailing winds at Aberystwyth are the genial westerly sea breezes, while the town is well protected from the cold northerly and easterly winds. In the matter of bright sunshine the locality is highly favoured at all times of the year, a result to which the absence of winter fogs contributes very materially. Thus Aberystwyth, with its pure and highly oxygenated air, and a climate at once equable and bracing, offers all the advantages of the most frequented Continental resorts. The Corporation have spent large sums of money in enhancing the natural attractions of the town. The promenade was in the year 1904 extended around the Castle promontory towards the harbour, at a cost of £17,000. The promenade itself has been paved with concrete slabs for the entire length of one mile and a half, and is one of the finest and most attractive in the kingdom. Shelters are provided on the north and south sides of the new promenade round the Castle promontory, enabling visitors to sit out in all weathers and watch the sea even when in its wildest mood, while on the Castle grounds a refreshing breeze may be secured, even on the warmest of summer days.

The Corporation have also been fully alive to the responsibility of safe-guarding the health of the community.

An efficient and well ventilated water carriage sewerage system has been taken throughout the town and is discharged at a point in mid-stream at the junction of the two rivers.

The other essential of a health resort—the water

supply—has also been attended to. An abundant supply "equal to if not superior in quality to that of the best waters in the kingdom," is obtained from a natural lake on Plynlimmon 1,600 feet above sea-level and high above any human habitation.

It is not surprising, therefore, to find that the town is immune from typhoid fever and that the zymotic death rate for the past year was the extremely low one of 0·25 per 1,000 as compared with 1·12, the rate for England and Wales.

In other respects the Corporation have made provision for the comfort of visitors by paving all the streets in the town; beautifying the promenade and streets by planting trees and flowers; lighting the promenade and main streets by electricity; by providing a promenade band; and a well stocked public library, the books of which are lent to visitors, and having a comfortable reading room open to visitors free of charge. Life and limb are safe-guarded by strict regulation for boating, bathing and driving, and there is an efficient fire brigade. On the college athletic grounds are very fine tennis courts, croquet grounds and bowling greens which are open to visitors during the summer months on the payment of a small fee.

The Corporation have recently secured an ideal position close to the town for the laying out of a fine golf course, which, it is expected, will be ready for play during the season of 1911.

The nearest golf-links at present are the well-known links at Borth, a distance of eight miles from Aberystwyth. The trains to Borth are frequent and special fares are quoted to golfers. Boating in the bay is provided for in crafts of all sizes including motor launches—which are annually overhauled by an independent boat builder and not licensed until his requirements are strictly complied with.

Ample arrangements are made also for bathing in the open sea, both mixed and separate.

Large swimming as well as private baths are provided in Bath Street, into which water is pumped daily direct from the sea, and given an equable temperature. Hot and cold sea water baths are also provided at the hydro on the Marine Terrace as well as electric, medicated, radiant heat and light baths. Aberystwyth is a capital centre for rambles. On the northern side of the Promenade is the Constitution Hill, which rises to an altitude of 500 feet, while on the southern side of the town is situated Pen Dinas which rises to 400 feet above sea level. Rambles over the Brynymor Hills to Cwm Woods, commencing eastward of the Promenade, in half an hour take one to a height whence may be seen six of the twelve counties of the Principality, and on a clear day the three chief mountains of Wales—Plynlimmon, Cader Idris and Snowdon—as well as about one hundred miles of coast, and a seascape of marvellous beauty.

A coach drive along the southern side of the Rheidol Valley ascending to nearly 1,000 feet above the sea at Aberystwyth, or an hour's train ride on the Vale of Rheidol Narrow Mountain Railway, takes the visitor through a charming valley to the Devil's Bridge, in the midst of scenery unsurpassed in Wales or anywhere in the kingdom.

The following meteorological statistics are based upon the average of daily readings taken during a period of ten years :—

Daily dry bulb temperature	50·6
,, minimum ,,	45·2
,, maximum ,,	54·7
,, range of ,,	9·5
,, mean ,,	49·9
,, relative humidity	81

Number of frosty days in the year	24
Number of sunless days	59
Annual bright sunshine	1,536 hr. 45 min.
,, rainfall, Castle gauge	26·77
,, ,, garden gauge	35·5

GOGERDDAN

By Evelyn Lewes

Some three miles from Aberystwyth, in the parish of Llanbadarn, stands Gogerddan, the home of the Pryses, a mansion which natives of the county have long been wont to associate with much that is delectable, whether they are those to whom the cry of hound and sound of horn are the sweetest music in the world, or those who love the softly whispered echoes of the past which their privileged ears can enjoy through the magic influence of old walls, old pictures, old books and old legends.

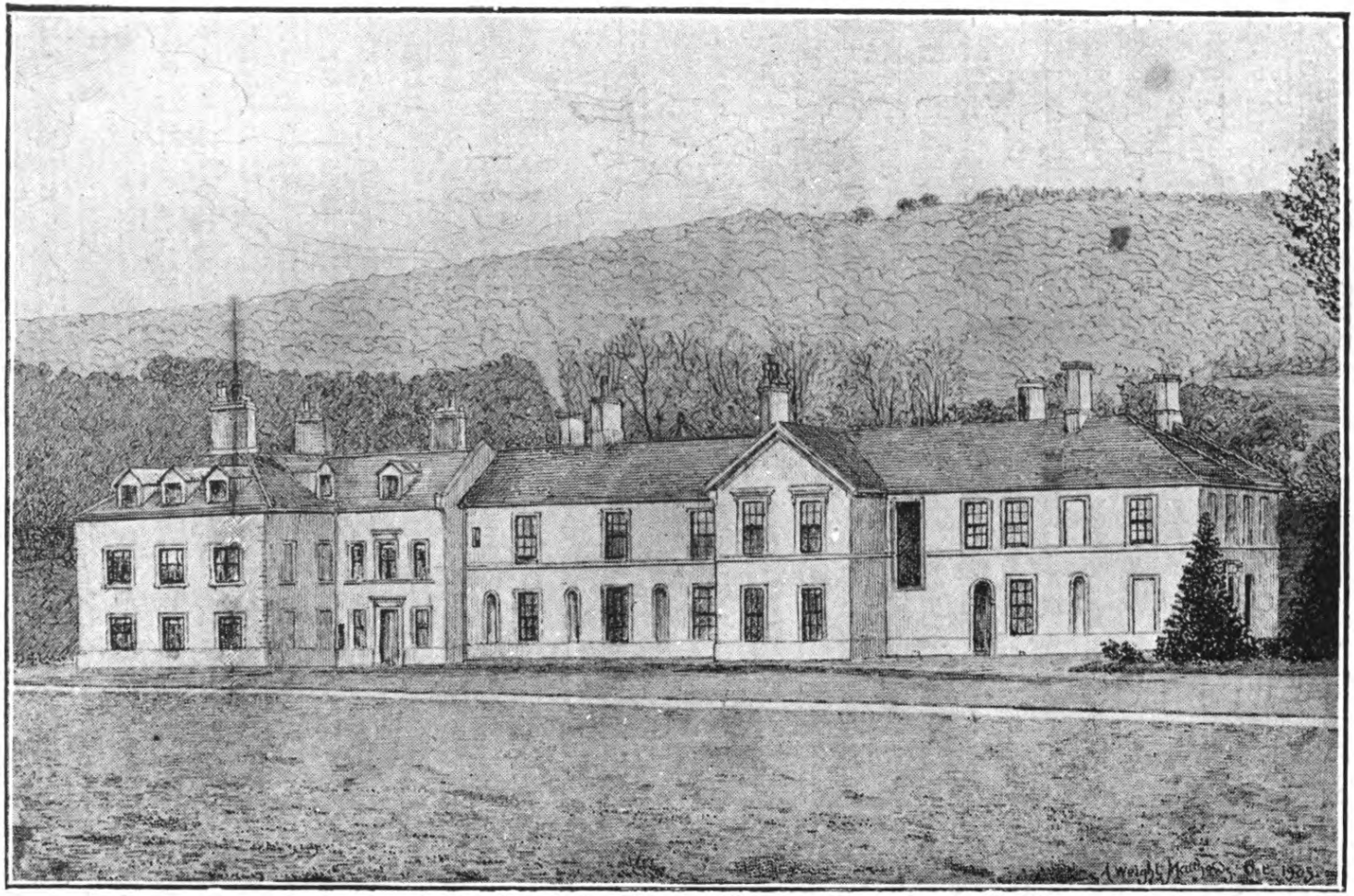
Everyone has a very good word to say for Sir Edward and Lady Pryse, and the mention of the Gogerddan Hounds is sufficient to arouse the enthusiasm of every sportsman in the district; while here or there in Aberystwyth, or some neighbouring hamlet, we may meet a genealogist who will speak of the history of the house and family and gladly explain that Sir Edward bears the coat of arms of Gwaethfoed Fawr, Prince of Ceredigion and Lord of Cibwyr, namely a black lion rampant on a golden shield. Probably a little more information will follow, and we shall gradually learn how a certain Rhys, the direct descendant of the same chieftain of the eleventh century, migrated from the Vale of Aeron to the neighbourhood of Llanbadarn; and how his son Richard ap Rhys, afterwards knighted, became known in course of time as the first Pryse of Gogerddan. When approaching the house by the winding laurel-bordered entrance-drive we cannot help thinking that if this

Rhys ap Dafydd Llwyd desired a secluded and sheltered home he acted wisely when he took up his abode at Gogerddan, for behind the long substantial mansion rises a thickly wooded hill, whilst in front, beyond vast stretches of smoothly mown lawn is a sister height which guards the homestead from storms off Cardigan Bay. On the summit of this hill is a British Camp, which suggests a possible explanation of the name Gogerddan, for the word Gogarth signifies a fortified hill, and in former times the house was known as Gogarthan.

The gardens and grounds of Gogerddan are delightfully reposeful, in fact the velvet turf surrounding the old Plas, the stream which flows so gently between mossy banks and rows of flowering shrubs, the winding paths beneath the stately trees, the quaint arbours and rockeries are suggestive of the well-known lines :

" All things in order stored—
A haunt of ancient Peace."

The original house of Gogarthan, the home of Rhys and Sir Richard his son, is generally understood to have been built in the year 1460, but no remains of this building now exist, the old portion of the present house being of later date. Sir Richard ap Rhys was succeeded at Gogarthan by his son John Pryse who was one of the council of the Marches of Wales, and from 1553–1555 a Member of Parliament. He married Elizabeth, a granddaughter of Sir Thomas Perrot, who was descended from the Earl of Norfolk, a son of Edward I. of England by his second wife Margaret of France. John Pryse was followed by his son Sir Richard Pryse, Knight, who died in 1622 and was buried in the church of Llanbadarn Fawr. He was known as Lord of Geneu Glyn and Tregaron, and in 1588 he entertained Lewys Dwnn the Welsh herald and poet, who visited Gogarthan to draw up the family pedigree. The older portion of the present



GOGERDDAN.—SEAT OF SIR EDWARD WEBLEY-PARRY-PRYSE, BART.
From a drawing by A. Weight Matthews, by permission of the Rev. Geo. Eyre Evans.

house was the same in 1745 as seen to-day, the modern wing having been added in 1860 by the late Sir Pryse Pryse. The comfortable spacious hall with its vast fireplace, and long polished table—formed it is said from the butt of a single Welsh oak—belongs to the old mansion which, according to a local legend, once sheltered a famous member of the Stuart line. The drawing-room and dining-room also speak plainly of old-time builders, as does the wide staircase leading to a number of pleasant chambers of the same date. Above the stairs and along the corridors are hung rows of pictures, principally portraits of Pryses long since laid to rest but not forgotten in the country. Some of the paintings are very fine, the presence of more than one Vandyke being explained by the fact that the Richard Pryse of Gogerddan, who in 1641 was created a baronet by Charles I., married as his second wife the widow of the famous artist.

It is impossible to look on these portraits without wishing to hear more of the family history, and we gradually learn how when the fourth Bart. Sir Carbury Pryse died unmarried in 1694 the baronetcy became extinct, and the Gogerddan estates passed to his kinsman Thomas Pryse of Glanvraed, and how Lewis Pryse, the next representative, was an ardent Jacobite, and one of those invited to assist the so-called old Pretender to recover his lost kingdom. Particularly imposing is the picture of Pryse Loveden Pryse, the son of Edward Loveden Townsend of Buscot Park, Berks, who married the heiress of Gogerddan, Margaret Pryse. Pryse Loveden Pryse who was twice married was the grandfather of the late Sir Pryse Pryse in whose favour the baronetcy was revived by royal license in 1866.

THE LITERARY ASSOCIATIONS OF ABERYSTWYTH

CELTIC glamour has woven many a romance about the district surrounding Aberystwyth. The great bay on whose shore it stands, was, legend says, at one time a fertile plain dotted with white homesteads where a happy and contented people lived at ease. Far away on the horizon was the great sea wall, erected in bygone times by an industrious and thriving race to withstand the onslaught of the ocean. The sea wall was the pride of the country, on its safety depended the preservation of the plain, and its inhabitants. Governments were turned out of office for neglecting its repair and young politicians waxed eloquent over its glories. But alas, one sad evening, a careless watchman flushed with strong drink, left the great flood gates ajar and the mighty sea swept its victorious way over people and homesteads and governments. It is said that the bells of Aberdovey may still be heard on a calm day, beneath the waters of the bay, and that old fishermen, when the sea is placid and clear in the early spring mornings, have seen the dim vestiges of palaces and cathedrals beneath the waves.

It was on the strand of this bay that the child Taliesin was washed ashore after Ceridwen his wicked mother had wrapped him in a leathern bag and cast him into the sea. Here he was found by an unhappy princeling of the country, and rescued from an untimely grave. The prince sought for pelf, and great was his astonishment when he beheld the radiant brow of the child-poet, "Taliesin (radiant brow) let him be called," said he. But still the prince grieved, for he was poor. "Why

dost thou grieve, great prince?" said the child, "for thou hast found that which is more powerful than wealth."

"There lies a virtue in my tongue.
That, having me, thou'st nought to fear."

Taliesin was the great poet of early Welsh Literature, and much of the poetry attributed to him is still preserved.

Leaving the mythical land beneath the sea, and the half mythical Taliesin we come to a very real personage, the redoubtable Giraldus Cambrensis, who visited Llanbadarn in 1188, when on his tour through Wales with Archbishop Baldwin, for the purpose of enlisting the aid of the Welsh in the third Crusade.

Gerald uses the occasion to have a jibe at the Lay Abbot who had usurped the revenues of Llanbadarn, leaving to the Clergy only the Altars with their Tenths and oblations of the Church, and even assigning these to their sons and relations.

The most authentic early literary traditions of the district are, however, associated with the name of the great Welsh Bard, Dafydd ap Gwilym, who was born at Broginin, a place six miles to the north-east of the town.

Dafydd was a contemporary of Chaucer, but his poetry is mainly lyrical, for he sang of love and nature. His poems contain many local references, and a few traditions about him still linger on the uplands of Plynlimmon.

Another famous Welsh Poet, Dafydd Nanmor, who died about the end of the 15th century, lived here for a time and sang odes to the ancestors of Sir Edward Pryse of Gogerddan. One of his poems, written to Llio Rhydderch, is amongst the most exquisite descriptions of woman's beauty in the Welsh language.

At the Abbey of Strata Florida to the south of the town, many of the Welsh Princes are buried, and

there the chronicle of their deeds was written and preserved. It is reputed that many Welsh Manuscripts were written by the industrious Monks, amongst whom was the famous Gutyn Owen, Historian and Herald Bard to the Abbeys of Strata Florida and Basingwerk in Flintshire. Many of his manuscripts may be seen in in the National Library.

In much later times the Reverend Evan Evans (Ieuan Brydydd Hir), a great transcriber of Welsh Manuscripts in the 18th century, kept a school at Aberystwyth. He was born near Strata Florida. His wide knowledge of Welsh literature brought him into contact with the Poet Gray and Bishop Percy. The correspondence between him and Bishop Percy has been preserved, and it is known that Gray's Bard is founded on Ieuan's Latin translation of some of the early Welsh Poetry.

Near Aberystwyth, also, lived the Antiquary, Lewis Morris, the patron of the luckless Welsh poet and man of genius, Goronwy Owen. Lewis Morris was a man of brilliant parts, artist and craftsman, poet and musician, sailor and mineralogist. He devoted much of his leisure time to the study of the literature and antiquities of his native country, and to his labours in this field may be attributed the revival of Welsh Literature in the eighteenth century. A number of his manuscripts and letters were bequeathed to the National Library by his great grandson, the late Sir Lewis Morris, author of the Epic of Hades and other well-known poems.

Sir Uvedale Price, writer on the Picturesque in Art and Nature, and the friend of Charles James Fox, Sheridan, Samuel Rogers and Wordsworth, resided in a house which has now been pulled down, and forms part of the site of the College. Prints of it may be seen in the National Library. The house was designed by Thomas Nash, the Architect of Regent Street.

Wordsworth visited the district in 1824 and embalmed

Brantwood,
Coniston. Lancashire.
26th June. 1889

Dear Mr Boswell

I had great delight in your visit - increased more by your telling me that anything I said of your lovely country seems to you worth repeating - from you seat of most honourable presidency.

My respect for its ancient and heroic nationality is indeed limitless - and well could I wish, for my Englands own sake that beyond Severn, the modes of life, the language, the music and the hearts, of the people she once oppressed so cruelly might remain for ever - in forgiveness, as your stones of Aberystwith are wrought by the cruel sea to their fairest colours.

How I envy you also your pilgrimage to Melrose & Dryburgh. Keep this glow of feeling faithfully through life, and remember me always as in all sincerity and affection Yours.

John Ruskin

Henry Boswell Esq.

his impressions in a sonnet to the torrent at Devil's Bridge, and in the better known poem Simon Lee, the old Huntsman.

John Ruskin, when a boy of fifteen, spent a holiday at Aberystwyth, in 1833, and " gathered pebbles on the beach," a fact felicitously referred to in a letter reproduced as one of the illustrations in this volume.

At Hafod near Devil's Bridge lived Thomas Johnes, the translator into English, of Froissart, Monstrelet and other French Chroniclers. Johnes was a Member of Parliament and Lord-Lieutenant of the County, and a friend and correspondent of the literary and political lights of the end of the eighteenth century. At Hafod he formed a great collection of pictures, books and manuscripts, some of which were destroyed by a disastrous fire. Here also he set up a printing press, where he printed and published many of his translations. The work of his press was of very superior character, and it is notable that such fine folios should have been produced in a remote district among the wild hills.

An interesting literary figure of the district in recent times was George Powell of Nanteos, the friend of Rossetti, Swinburne, Solomon and other members of the Pre-Raphaelite Brotherhood. Mr. Powell was one of the first British scholars to take an interest in Icelandic Literature, and he published, in conjunction with the Icelandic scholar Magnusson, a translation of John Arnason's collection of the Icelandic Legends. Unfortunately Powell died whilst yet a young man. He bequeathed a great part of his collection of books, pictures, music and curiosities to the University College of Wales, where they may be seen.

From time to time many well-known Englishmen have visited the district. The Reverend Thomas Richards and Isaac Williams, one of the leaders of the Tractarian Movement, who lived at Wallog, were visited by many

eminent men, including Wilberforce and Clarkson, the leaders of slave emancipation, and John Keble.

Among many other notable visitors may be mentioned the Laureate, Lord Tennyson, 1839; the Reverend Edward Irving; Prince Lucien Bonaparte no doubt bent on philological studies; John Bright; Cardinal Manning; Sir Leslie Stephen, and the great schoolmaster Edward Irving of Uppingham.

In 1896 His late Majesty Edward VII., then Prince of Wales, was installed as the first Chancellor of the University of Wales, at Aberystwyth, and the great gathering of notables included the Queen Mother, then Princess of Wales, the Princess Victoria, and Princess Maud, now Queen of Norway. Mr. and Mrs. Gladstone were also present at the installation ceremony, which was followed by the admission of the Queen Mother to the degree of Doctor in Music, *honoris causa*.

THE UNIVERSITY OF WALES

By Edward Anwyl, M.A., Professor of Welsh and Comparative Philology in the University College of Wales; President of the Theological Board of the University of Wales.

The University of Wales is, like the other modern Universities of the United Kingdom, a University constituted by Royal Charter granted through the Privy Council. It received its Charter in 1893, but the Constituent Colleges of which it is constituted received their Charters in the 'eighties, while one of the colleges, that of Aberystwyth, had been carried on for some years without a Charter or a Government grant, being supported, as Welshmen everywhere know, by the pence of the Welsh people. Yet the University movement in Wales is older even than the opening of the University College of Wales at Aberystwyth, and it was only after years of planning that the project of establishing a University or University College in Wales became a reality. It is to be hoped that at no distant date the University College of Wales, Aberystwyth, will publish its early minute books, in which it is possible to trace step by step the real history of the University movement in the Principality. A perusal of these minute books shows that the University movement in Wales was not due to the patriotism or the benevolence of individuals, however generous (and Wales owes a deep debt of gratitude to many of her sons), but arose from the depths of the national life of the Welsh people, and from the desire of the nation generally for better means

of enlightenment and knowledge. The University of Wales in its original and essential features is the fruit of a movement, like the Eisteddfod and the Theological Colleges, which has arisen to supply certain needs that Welshmen felt acutely in their life as a people. These needs were not primarily material but intellectual and spiritual, and it is evident that the foundation of institutions such as these could not fail to have far-reaching consequences in the life of a people. Welshmen who left Wales before the growth of the Welsh University Colleges and the establishment of the Welsh County Schools, find themselves on their return in a new country, and see effects upon the life of Wales that are only just beginning. Already some hundreds of Welshmen have graduated and the number of those who proceed to places of higher learning is steadily increasing. Nor is this the only aspect which deserves attention, for an even more important and significant feature of Welsh University life is the fact that a considerable number of Welshmen now pursue a course of post-graduate study and make a commencement in the sphere of research. The establishment of a National Library for Wales and a National Museum has not come about a moment too soon to meet, among others, the new needs that have arisen. There is no reason why so important a part of the United Kingdom as Wales should, in the equipment of its higher mental activities, be on a lower plane than any part of the world.

The University of Wales is in form a federation of its three Constituent Colleges, but it has also the means of associating with it other institutions for theological teaching. The idea of University federation is not a prominent one in academic circles at the present day, but Wales cherishes the idea of possessing one University, on account of the emphasis which it lays on national unity and the bond which it affords between the various

parts of the country in their higher intellectual activities. Whatever other parts of the United Kingdom may do, it is very improbable that the Welsh people will readily abandon the idea of having one national University of Wales, any more than it would sanction the substitution of three provincial Eisteddfodau for one national Eisteddfod.

Like the University colleges, and modern Universities generally, the administrative machinery and constitution of the University of Wales consists of a large University Court, consisting of representatives of the Crown, the Central Welsh Board, County Councils, and County Borough Councils, the Constituent Colleges, Secondary and Primary Teachers, and some co-opted members. In Academic matters (excluding Theology), the University Court has the help and advice of the University Senate, a large body composed of the heads of teaching departments in the constituent colleges. It has also power to form consultative or advisory committees composed in whole or in part of its own members. Such an Advisory Committee in Theology has been in existence almost from the foundation of the University and it bears the name of the Theological Board. In certain matters relating to Theology, too, the University of Wales receives the advice and help of the Theological Senate, a body composed of the members of the teaching staffs of those Theological Colleges that have qualified for representation on the Theological Board of the University. There is also an Advisory Committee for Medicine called the Medical Board. It may also be stated that side by side with the University Court and the University Senate there is another body, the Guild of Graduates, of which graduates of the University of two years standing and upwards are members, that has the right to make representations from time to time to the University Court, and that has in various ways rendered service to the University.

The chief officer of the University is the Chancellor. The first Chancellor was the Right Hon. Lord Aberdare, then the office was held by his late Majesty, King Edward VII., when Prince of Wales, and for a short time afterwards, until his present Majesty, George V., was elected to the office. On relinquishing the Chancellorship his late Majesty was graciously pleased to create for himself a new office, that of Protector of the University. In the absence of the Chancellor the Court is presided over by one of the two Deputy Chancellors, the Senior and Junior, respectively. There is also a Vice-Chancellor, who presides over the meetings of the Senate, and who is the chief academic officer of the Court. The Vice-Chancellorship is held by the principals of the three constituent colleges in turn. The Senior Deputy Chancellorship was held for some years by Sir Isambard Owen, M.D., D.C.L., but the office is now held by the Right Hon. Lord Kenyon. The Junior Deputy Chancellorship has been held by several distinguished Welshmen.

The Court of the University of Wales meets at least twice a year; once in one of the University College towns in rotation, and once in some other town in the Principality. The former is called a Collegiate, and the latter a non-Collegiate Meeting. The Executive Committee of the Court as well as the two Deputy Chancellors are elected at the latter meeting, while the Collegiate Meeting is the one at which degrees are conferred. The examinations for degrees take place in June.

The University has the power of conferring degrees in the faculties of arts, science, applied science, law, medicine, music and theology. The Charters of the Constituent Colleges do not allow them to teach theology, and the theological teaching for the degree of B.D. in the University of Wales is carried on in theological

colleges that are associated for this purpose with the University. The study of medicine is carried on only at Cardiff, and the study of law only at Aberystwyth. The examination papers are set at the same time in all these colleges, but are not set necessarily on precisely the same syllabuses. It is the duty, however, of the University Senate to see that the syllabuses offered by the different colleges do not vary in difficulty. The system of examination, like that of Scotland and the newer Universities of the United Kingdom, is entrusted to Joint Committees, consisting in each subject of an external examiner appointed by the University and three internal examiners, one appointed by each of the constituent colleges; the final decision as to the fate of a candidate rests, however, with the external examiner alone.

The curriculum of the University of Wales aims at giving the candidate fair opportunities for following the natural bent of his mind, while seeking to give him that broad mental training and discipline which should never be dissociated from University education. The number of students who enter for the degrees is considerable and includes a fair proportion of students from England. A considerable number of graduates of the University of Wales hold posts in England and are in every way upholding the reputation of their University.

The University of Wales has, since its foundation, kept in close touch with the primary as well as the secondary teachers of Wales, and some of the most respected members of the University Court have been primary teachers. There are probably few Universities where a sense of the solidarity of the teaching profession is more widely diffused, and this is an element of strength not only to the teaching profession but to the University itself. May this harmonious state of things long continue.

THE CENTRAL WELSH BOARD FOR INTERMEDIATE EDUCATION

By EDWARD ANWYL, M.A., Professor of Welsh and Comparative Philology in the University College of Wales; Chairman of the Central Welsh Board for Intermediate Education.

THE Central Welsh Board for Intermediate Education has of necessity played an important part in the evolution of education in Wales for several years past, and, though its immediate sphere is that of the Welsh County School system, its work and aims have indirectly affected the University Education of Wales and in some degree the Primary Schools of the country. It may be of advantage, therefore, to explain what the constitution and functions of this Board are, and incidentally to give some account of its history and of its work.

The Board owes its origin to those Welshmen and friends of Wales who, with rare far-sightedness and practical knowledge of affairs, succeeded in passing through Parliament the Welsh Intermediate Education Act of 1889. This Act of Parliament was, in the matter of legislation, an Act which formed a continuation in respect to Wales and Monmouthshire of the Endowed Schools Act of 1869 and of its amending Acts. Like the Endowed Schools generally, the Welsh County Schools came under the supervision of the Charity Commission, some of them being existing schools governed by scheme under the Endowed Schools Act,

while others were new schools established for the first time by scheme under the Welsh Intermediate Education Act. The promoters of the Welsh Act were anxious, however, that the Welsh County Intermediate Schools should not be isolated units, but parts of a national system, and steps were consequently taken in the Act of 1889 to make this possible. In the first place, the schools of each county were grouped together under the control of a County Governing Body, and it may be of interest to note that the system of County Education Bodies, which are now general throughout England and Wales as County Education Committees, was first tried outside the sphere of purely technical education in connection with Welsh Intermediate Education. It is obvious that this step was rendered possible through the establishment of County Councils, which provided the machinery for local self-government for the county area.

The promoters of the Welsh Intermediate educational system might conceivably have gone no further in their efforts at grouping together the County Schools of Wales, and might have left the Counties and the County Boroughs to form a loose aggregation, with at any rate no formal bond between them, except their common relation to the Welsh Intermediate Education Act and to the Charity Commissioners. The present writer, though he has been a member of the Central Welsh Board from its foundation, had not the honour of being a member of the Committees which took the important step of planning its establishment, and so he cannot, except from hearsay, form an opinion as to the motives which actuated its founders. It seems abundantly clear, however, that one of the governing motives of these patriotic and statesmanlike men was that of emphasising, in the sphere of Welsh national education, the unity of Wales and of counteracting any possible risk of national disintegration in the educational sphere. Another aim

undoubtedly was that of enabling the representatives of the various counties to confer periodically together and to discuss common problems from a national standpoint. It was also considered important that the special needs of Wales should receive full satisfaction in her educational system, and it was thought well that the new Welsh national body to be constituted should be able on the one hand to express the needs of Wales and on the other to satisfy them. Hence, a large and representative body was created, not a small body of Commissioners as in Ireland, and the experiment was certainly one that showed no small originality and courage on the part of those who were responsible for it. Another step that was taken showed even greater courage, and, as the event has shown, true statesmanship. Even had the Counties and County Boroughs of Wales been united together only to the extent of being able to meet in educational conference and to pass resolutions, it is certain that many able and estimable Welsh men and Welsh women would have been willing in that way to render service to their country, but it is unfair to expect the ablest and the busiest of local administrators to attend national assemblies, unless those assemblies provide them with work of a substantial and real kind. Hence, the founders of the Central Welsh Board took the bold but abundantly justified step of entrusting the new national body that was in contemplation with the examination and inspection of the Welsh County Schools and of certain other schools which came under the category of endowed schools. This function, however, of the Central Welsh Board was not by any means placed absolutely in its hands, inasmuch as the Charity Commissioners retained the right of direct inspection and examination on their own behalf in case of any inadequacy of the inspection and examination of the Central Welsh Board. The Charity Commissioners, too,

have a right, in accordance with a Treasury Regulation, to attend, through any officer authorised in that behalf, any meeting of the Central Welsh Board for Intermediate Education or of any Committee of that Board, and to take part in the proceedings, but such officer has no right to vote.

The present successors of the Charity Commissioners in respect of the educational side of their work are the Board of Education, a body which was not in existence when the Central Welsh Board was founded. The continuance of the work of the Central Welsh Board is expressly mentioned in the Board of Education Act of 1899. It is interesting to note that in the past the Charity Commissioners and the Board of Education were represented at the meetings of the Central Welsh Board by the Hon. W. N. Bruce, C.B., son of the late Lord Aberdare and now Chief Assistant Secretary on the Secondary side of the Board of Education; by Sir Robert Morant, K.C.B., now Permanent Secretary to the Board of Education; by Mr. Lefroy, of the Charity Commission; by Captain Shaw, formerly Chief Inspector for Secondary Education in Wales under the Board of Education; while at present the meetings of the Board and of its Executive Committee are attended by Mr. O. M. Edwards, Chief Inspector for Wales of the Board of Education, and by Mr. J. L. Casson, formerly of the Charity Commission and now of the Board of Education.

In view of the chief functions of the Central Welsh Board, its constitution was naturally one that required careful adjustment. It needed a large representative element, in order to be in touch with the needs of every part of Wales, while on the other hand it needed a guarantee for expert knowledge of the principles and the details of Secondary and Higher Education as well as direct relationship to all grades of education in the country. Moreover, it was clearly impossible for it to do its work

without a comparatively small Executive Committee, which should combine both general and expert knowledge of Secondary Education. The Board as a whole was made to consist of 80 members and the Executive Committee of 15. Technically the Board consists of three sections: (1) The *Ex-Officio* Section, consisting of the Principals of the three University Colleges of Aberystwyth, Bangor and Cardiff; (2) the Representative Section, consisting in all of 71 members, the bodies represented being the County Councils and County Governing Bodies of Wales and Monmouthshire; the Headmasters and Headmistresses of the Welsh County Schools, the Certificated teachers of the Welsh Public Elementary Schools; the Councils and Senates of the Welsh University Colleges; the Principal and Fellows of Jesus College, Oxford, and the Court of the University of Wales. The third section, consisting of six members, was to be chosen by co-optation. In all the elections of the Board and of its Executive Committee women are equally eligible with men. The person appointed as a Representative Member need not be a member of the electing body.

The scheme constituting the Central Welsh Board was approved by her late Majesty Queen Victoria in Council on May 13th, 1896, two or three years after some of the new County Schools had been opened and in the year when his late Majesty King Edward VII., then Prince of Wales, was installed at Aberystwyth as Chancellor of the University of Wales. The first Chairman (named in the scheme) was Mr. A. C. Humphreys-Owen, M.P., whose services to Welsh education and to Welsh public life will be long remembered. The first Vice-Chairman (elected at the first meeting) was the late Principal J. Viriamu Jones, F.R.S. It was little thought when the Board began its work in 1897 that in a few years the number of pupils in the Welsh County Schools would have reached the total of 14,000, and that practically

every pupil entering the University Colleges of Wales would have qualified for matriculation before entry.

The present writer had the honour of examining the county schools in three counties for three years before the Central Welsh Board began its work, and he well remembers the distraction then caused to the schools by the necessity of preparing pupils for a multiplicity of examinations, very largely in preparation for different University and professional careers. The methods too, of examining for County Exhibitions in the different counties were very tentative and incomplete. It was clear to the Central Welsh Board at the outset that before the schools could be freed from the burden of a multiplicity of examinations the Central Welsh Board would require to have certificates for which the schools could work concomitantly with their school examination, and of a kind which would be readily accepted by University and other public and professional bodies. This meant that the Board's examiners should be men of high and recognized standing, whose names would command the respect of the various bodies that should be asked to recognize the Board's certificates. The result is that the Board's certificates are now accepted by a large number of University and similar bodies, and the schools are not obliged to spread their energies over preparation for a number of outside examinations. In its early years the Central Board conducted an annual examination of the whole school from the highest class to the lowest, but with maturer educational experience the Board thought it inadvisable to conduct annual examinations at stages below that of the Junior Certificate, though it still has the power to do so where the condition of a given school may render it necessary. The Central Welsh Board has now arranged its examinations in stages: (1) The Junior stage where the examination is intended to be of a moderately easy character,

and a means of introducing the pupil for the first time, it may be, to the test of a public examination. (2) The Senior stage, where the examination is meant to be a test of the possession by the pupil of a sound Secondary education. This stage is one whose certificate is widely accepted and forms the avenue to many important careers. Above the Senior stage there are two stages which stand in a different category from the preceding. There is the Honours stage, which is meant as a guide and a test of knowledge only for those pupils who have outstanding ability, and who may be expected to win scholarships or exhibitions in places of higher learning, and the Higher Certificate stage, which is meant as a test for those pupils of moderate ability who stay on at school a year or two after passing the Senior Certificate. There is therefore a bifurcation of curriculum rendered possible in the upper part of a school. The Honours and the Higher Certificate stages provide the curricula upon which the examination is held, not only for these Certificates, but also for the award of County Scholarships and Exhibitions to places of higher learning.

One of the features of the Welsh Intermediate system is, that the county schools are judged not merely on their examination results, but on the general organisation and progress of the schools as tested by inspection. Thus, the Central Welsh Board is, from two points of view, in the closest touch with the schools that are under its charge, and the recommendation to the Board of Education, and to the Treasury for the annual Treasury grant is always made after a consideration of the condition of a given school from both of these aspects. Moreover there are two representatives of the head teachers on the Executive Committee which draws up the syllabus, and the Board has a system whereby a school may offer an approved alternative scheme of study of its own instead of that included in the Board's syllabus. Wherever

such an alternative scheme embodies some clear educational principle, and is of equal difficulty to that contained in the syllabus, the Board cordially welcomes it.

The Central Welsh Board was a pioneer in the movement which made it possible for the county schools to participate under better terms than heretofore in the South Kensington grants for the teaching of Science, and its efforts in the direction paved the way to the giving of grants by the Board of Education for Secondary Education as such. In all its actions the Central Board has aimed at guiding the county schools of Wales in the path of true educational progress by avoiding the Scylla of reaction on the one hand, and the Charybdis of wild experiment on the other.

THE NATIONAL LIBRARY OF WALES

By JOHN BALLINGER, Hon. M.A. (Wales)

FOR many years the desire of the Welsh people for a National Library, and a National Museum, was little more than a dream, and in spite of persistent demands the claims of Wales in regard to these institutions were put off from time to time, upon various pretexts.

The movement for the National Library dates back at any rate to the year 1872, when a large gathering of Welsh people assembled for the Mold Eisteddfod, passed a resolution in favour of founding such a Library in conjunction with the first of the Welsh Colleges then recently opened at Aberystwyth.

In the same year a copy of the first Welsh Bible, 1588, was sent to the College by the Rev. W. Morris Lewis of Ty Llwyd, Penycwm, Pembrokeshire, with a letter stating that, acting on the advice of a friend, the Rev. Daniel Evans of Ffosyffin, Cardiganshire, he presented it on the understanding that it should form the foundation of a Welsh National Library, at Aberystwyth. Mr. Lewis is still living, and is greatly rejoiced that, after so many years, the idea of a National Library has been realised. The volume he presented will ever have an honoured place among the treasures of the Library

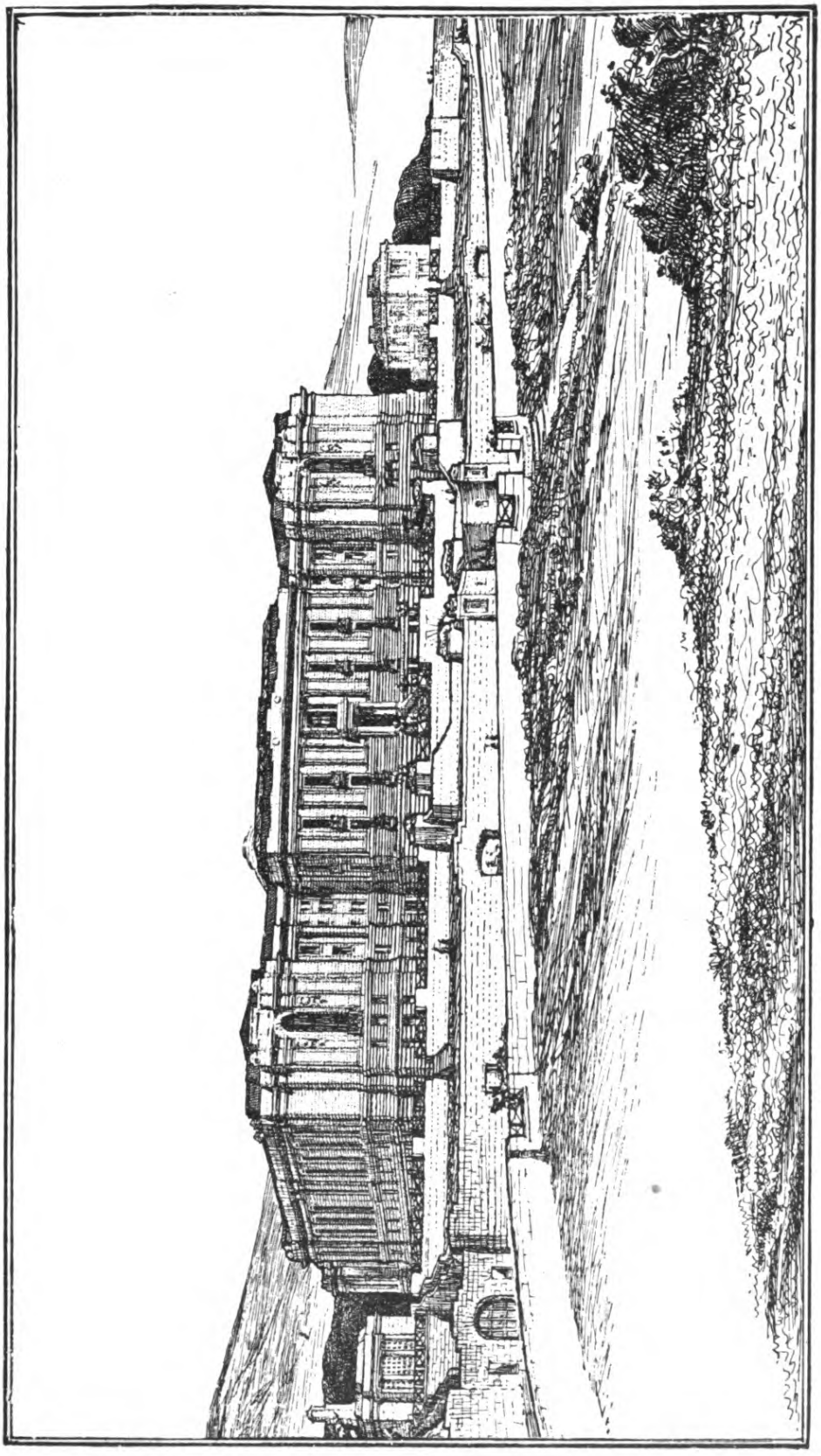
About the same time the mind of another man was occupied with the same idea—Dr. John Williams as he then was, Sir John Williams, Bart., K.C.V.O., as we know him to-day, commenced his great collection of Welsh Manuscripts and Books forty years ago. He did

guydi · taliessin · bitchaud ·
kyffredin · vydarogan ·

Breuddwyt

Breuduid auelun neithw
ir ysceluit ae dehoglho ·
Nyritreithir yreuit · nis
guibit ar nuygelho · Guerthred
llara llyuiau niuer nidhoffet
meiuret bro · Neur uum ydan
un duted abun tlec liu guanec
gro · Nid cur llauur urth din
da · ae coffa arnuydalho · Gua
ech ·

Black Book of Carmarthen.



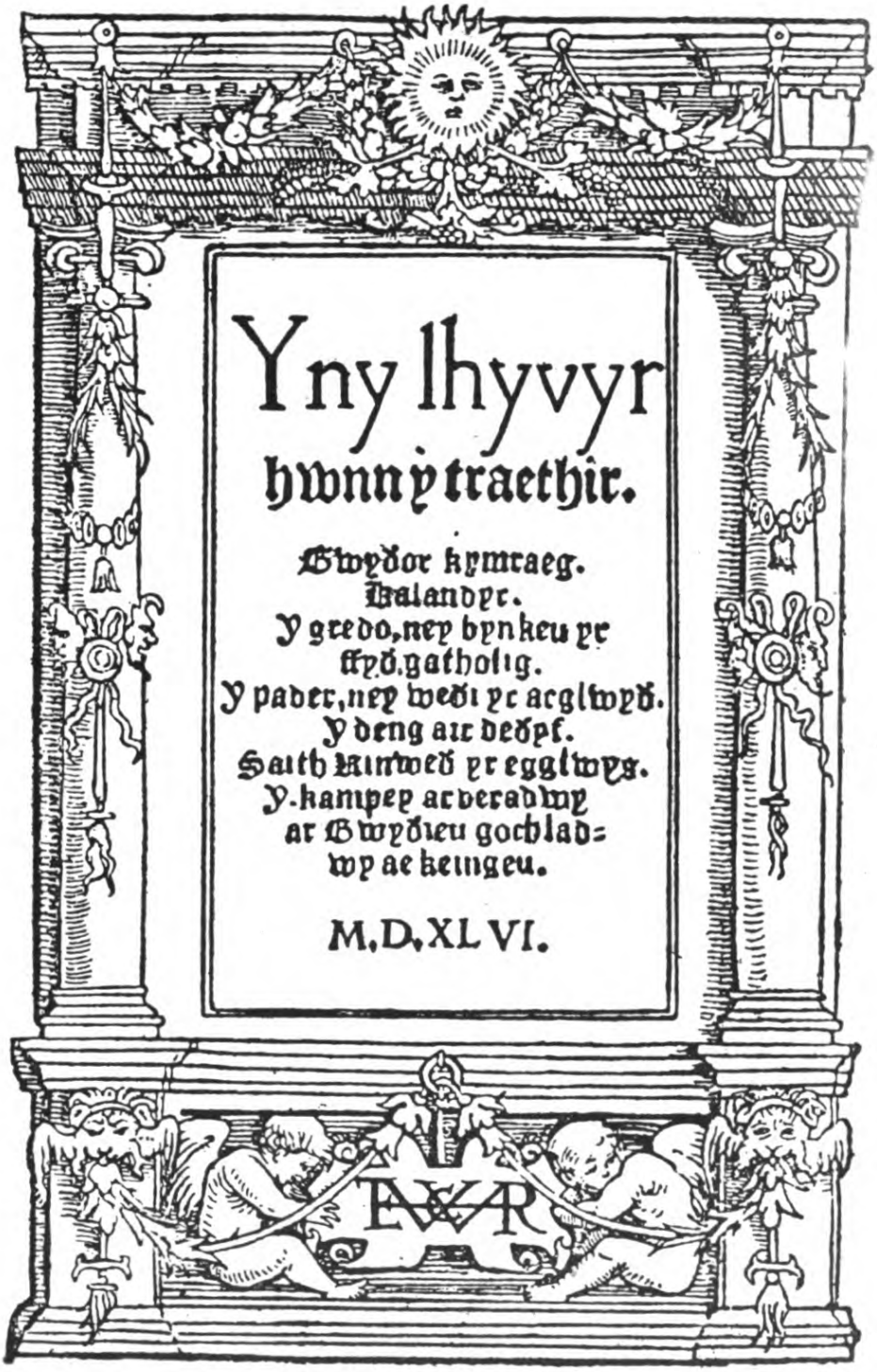
National Library of Wales, Proposed Building.

so with the future National Library ever before him, and when the dream became a reality, Sir John at once handed over the whole of his collections.

A Royal Charter founding the Library was granted by His late Majesty King Edward VII., in March, 1907, and the necessary steps were immediately taken for bringing into existence the Governing bodies, and to enact the statutes.

The Library itself, as a place with a habitation, came into existence on January 1st, 1909, a temporary home being fitted up for it in the building known as the Old Assembly Rooms. The building is a commodious one, and has lent itself admirably to adaptation as a temporary home, but the growth of the collections has been so rapid that it will shortly be necessary to take a supplementary building for storage of books, pending the erection of the first section of the permanent building, which will take at least three years. The site of the new building is on the Grogythan lands, above the Llanbadarn Road. It is a plateau 180 feet above sea level, overlooking the town, and commanding extensive views of Cardigan Bay and the Vale of Rheidol, while hills rise at a respectful distance behind. Close to the town, yet clear of all other buildings, the National Library will stand out boldly and be seen from many points far and near. Their Majesties the King and Queen will visit Aberystwyth on July 15th, 1911, to lay the foundation stone of the new building.

This site, of nearly 6 acres, has been generously given by Lord Rendel. Thanks to this munificent gift of land it has been possible to design a building free from the restrictions which limit architects when designing a library for a crowded town site. The dimensions are on a scale commensurate with a building of national importance. The frontage will be 250 feet, and each of the sides will be of the same dimension.



THE FIRST BOOK PRINTED IN WELSH.

The main features of the plan are :

(1) The Administration Block, which is in front ;

(2) The Library Hall for printed books, and for readers ;

(3) The Exhibition Hall, with a print room on the main floor, and exhibition rooms above ;

(5) The Manuscript Department, self-contained and isolated ; and

(6) The Central Hall, through which visitors must pass to reach each section.

The design is bold and simple as befits a group of buildings erected on an eminence, which will be seen from many points, and mostly from a distance. The estimated cost is £145,000.

Wales presented unusual difficulties with regard to the place where the National Library should be established. The choice finally lay between Cardiff and Aberystwyth, and the latter was chosen by a Committee of the Privy Council, after full consideration of the facts submitted in support of each place.

It may safely be said that wherever the site of the Library, it would be remote and difficult to reach from many parts of the Principality. On the whole the decision to place it in the most important town near the centre of Wales is a wise solution. Aberystwyth is the seat of the oldest of the three University Colleges which constitute the University of Wales, and modern Welsh sentiment attaches itself to Aberystwyth more than to any other town.

Cardiff, or some other town in Glamorgan, would have the advantage of a large surrounding population, but experience shows that the literary activity of Wales flourishes more outside the busy industrial centres than in them. And, too, there are good libraries at Cardiff, Swansea, and Newport, while the whole of North, Mid, and West Wales is absolutely destitute of libraries of any size.

One thing is quite clear: the special circumstances of Wales must be met by special arrangements for the use of the books in the National Library. It is found that research workers who wish to use manuscripts and rare books can and do visit Aberystwyth for the purpose. When they are unable to do so, or where the references required are so brief as not to make a journey feasible, between the staffs of the library and college it is always possible to get the required copying or verifications made for quite moderate charges. There remain, however, a large number of people engaged in literary work, in teaching, and in preparing knowledge to be imparted to others in one form or another, who for want of time, want of means, or lack of urgency, are unable to visit the library. The books they require are not rare books, but the standard books, which, owing to the absence of even average libraries, they are unable to obtain. To meet this difficulty it is intended to form a library of duplicates, available under certain conditions for circulation. This is the only way of meeting a difficulty which is partly financial and largely geographical. Wales is a poor country. To ignore these facts would mean denying the advantages of the National Library to many who will, with the aid of the intended circulating department, do better work than they otherwise could.

The aim of the Library may be briefly, though imperfectly, summed up as follows, viz. :—

(1) That it shall offer to the people residing in Wales opportunities for study and research in all departments of knowledge similar to those afforded by other National Libraries. It will collect, therefore, books on all subjects, in English and other languages.

(2) That it shall collect all the works of Welshmen and Welshwomen of all ages: everything about Wales, and the Welsh people at home and

abroad; and books in all the Celtic languages (Welsh, Gaelic, Manx, Breton, and Cornish), and all books dealing with Celtic matters.

This programme, as will readily be seen, falls naturally into two divisions: the encouragement of higher studies in Wales, and the formation of a special library for Celtic studies.

The organisation of the Library is necessarily not complete, but so far as it has gone, the scheme comprises five departments, viz. :—

I.—Manuscripts.
Local Manuscript Records.
II.—Printed Books.
(*a*) Main Library.
(*b*) Celtic Books and Journals.
(*c*) Newspapers and Periodicals published in Wales.
III.—Prints and Drawings, Maps, etc.
IV.—Music.
V.—Documents.

The Library already possess the finest collection of Welsh books and manuscripts in existence, largely through the foresight and munificence of Sir John Williams, who had purchased the great Hengwrt and Peniarth collection of manuscripts, and the valuable Welsh manuscripts and early Welsh books from Shirburn Castle. These, and treasures innumerable from many other sources, make up a Library of which the people of Wales are justly very proud.

It is obviously impossible, within the limits assigned to this sketch, to mention even a small fraction of the objects of interest which the Library contains. The illustrations to this paper include: (1) A page from the Black Book of Carmarthen, the earliest known manuscript in the Welsh language, the oldest part written before the year 1195; (2) a facsimile of the title page

Cân o Senn iw hên Feiſtr

TOBACCO

A Gyfanſoddodd Gwaſanaethwr Ammodol iddo Gyn't pan dorodd ar ei Ammod ac ef, ynghŷd a'r Rheſſymmeu paham y deffygiodd yng waſanaeth y Concwerwr beunyddiol hwnnw. Ar hen Dôn ac oedd drigannol yn y *D*eyrnas hon Lawer Blwydd ŷn faith Cyn Tirio'r crwydryn ynthi ag a Elwid y *Frwyner tâs*, neu *Dan y Coed* a *Thany Gwydd* Y mae'r 8 ſylaſ gyntaf o'r breichiau yn groes rowiog o r draws gyhydedd, a'r berreu'n amlaf yn Cyſochori.

Argraphwyd yn Nhre-Hedyn, *gan* Iſaac Carter *yn y Flwyddyn* 1718.

The first book printed in Wales.

of the first printed book in the Welsh language, 1546; and (3) a facsimile of one of the two pieces of Welsh literature printed in the year 1718, at the first printing press set up within the borders of the Principality. The last mentioned has a quaint title which may be partly translated: "A song of censure to his old master, Tobacco, which was composed by a former bondservant of his when he broke his pledge to him, etc."

Besides numerous MSS. of the Arthurian and other early romances, the oldest texts extant of the Welsh Laws of Howell the Good, and of the Chronicle of Geoffrey of Monmouth, the Library contains one of the most valuable Chaucer manuscripts in existence, known as the Hengwrt MS., a folio on vellum, bound in oak boards covered with pigskin, and written about 1420. Professor Skeat writes of this MS., "The Hengwrt MS. of the Canterbury Tales is known to be one of the best. It stands second among the seven MSS. selected and printed by the Chaucer Society. An examination of its contents shows that it is unique, not only in the arrangement of the Tales, but in particulars relating to the Tales themselves."

The Library is maintained by an annual grant from the Government.

THE UNIVERSITY COLLEGE OF WALES

THE University College of Wales, Aberystwyth, has crowded into its thirty-eight years of life a long story of struggles and achievements in face of seemingly overwhelming difficulties, and this has given it a vigour and a direct hold on the Welsh people, for whose benefit it exists, which it could hardly have gained had it been the direct creation of a public authority. It was the outcome of the desire of the common people for education, and again and again they have rallied to its support in the crises of its history.

The first plan was that of a University for Wales, and the promoters, in 1864, were Dr. Nicholas, Mr. (afterwards Sir) Hugh Owen, Mr. (afterwards Sir) George Osborne Morgan and Mr. Morgan Lloyd. The scheme met great obstacles, and it was only after many years that a University for Wales came into existence, but by 1867, thanks to widespread support and to help from rich and poor alike, the Committee was in a position to buy what was then the unfinished Castle Hotel at Aberystwyth for £10,000, though this left them with a considerable debt.

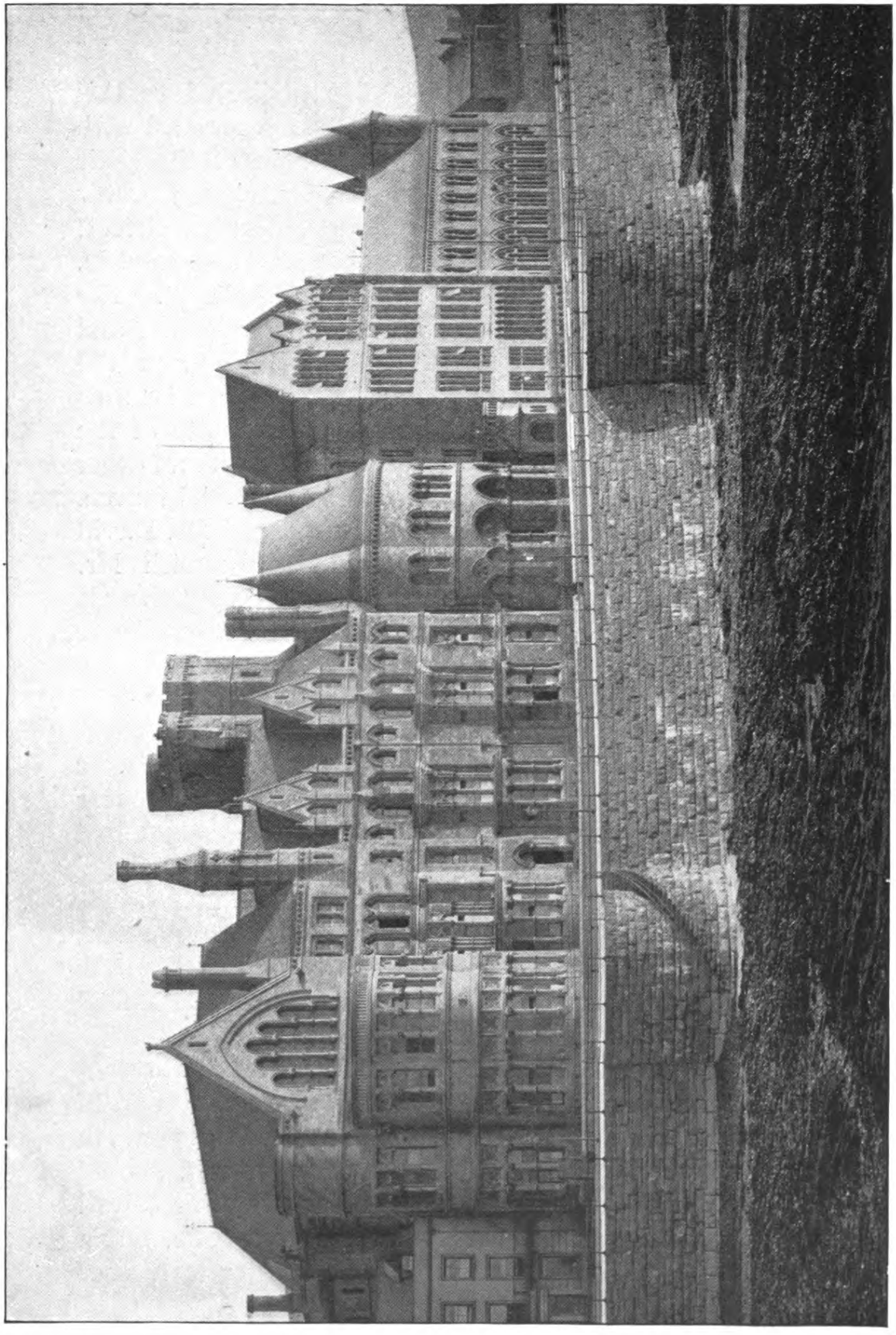
The scheme met with Mr. Gladstone's sympathy, but his Government, 1868–1874, could not see its way to give a grant towards the maintenance of the College, although help was already accorded to the Scotch Universities and the Queen's Colleges in Ireland. The revenue difficulty made it impossible to open the College for some years, and it was only on October 8th, 1872, that work began, with Rev. Thomas Charles Edwards, M.A., as Principal, Professor Hoskyns Abrahall taking

Classics, and Professor Grimley Mathematics, while Rev. Penllyn Jones acted as Registrar and Librarian. Among the staunch supporters of the College at this stage we already find the name of Mr. David Davies of Llandinam, as also those of Alderman J. Ffoulkes Roberts of Manchester and " Gohebydd."

Twenty-five students entered at once, and the numbers rose to sixty-two by the end of the first session, while Dr. Thibaut was appointed Professor of Modern and Oriental Languages, and Dr. Joseph Parry, Professor of Music. Professor Abrahall resigned his post, and in September, 1873, Professor J. Mortimer Angus began his long career of service to the College.

Mr. Hugh Owen's energy and foresight had led him to work for a University of Wales ; it also led him and his helpers to strive for a National Library in connection with the College which they hoped would develop on University lines, and we find schemes to this end set on foot in 1873. It seems peculiarly fitting that now, after many years of work, Aberystwyth College should be the eldest of the three sister Colleges of the national University, and that Aberystwyth should possess the National Library with those treasured Welsh manuscripts and books which it was Mr. Owen's aim to gather there.

Work continued, and a Professorship of Natural Science created, to which Mr. Leonard Lyell was appointed. Dr. Thibaut resigned his chair in 1875, and Dr. H. Ethé, who is still Professor of Oriental Languages and German, was appointed as his successor. The number of students had risen meanwhile to 126, but the provision of revenue was becoming a greater difficulty than ever, and appeals to the Treasury were rejected even though the Committee could show, as it did in 1875, that no less than £30,000 had been raised. The quarrymen of North Wales, the Welsh Commercial Travellers, places of worship throughout the country



General View of College.

and the people generally had all contributed to this sum, and Messrs. H. and R. Parnall came forward with a gift of £2,500 towards the maintenance of the chair of Natural Science. Mr. F. W. Rudler, since Curator of the Museum of Practical Geology, Jermyn Street, London, succeeded Mr. Lyell in this chair, and Rev. D. Silvan Evans was appointed Professor of Welsh. The next year Mr. Keeping succeeded Professor Rudler and began the definite organisation of a Museum at the College. The struggle for existence grew more keen as the number of students increased, and in spite of the wise and liberal support of the Messrs. Parnall and other friends the College was threatened with financial failure. Meanwhile, its friends rallied still closer, and Mr. David Davies accepted the Treasurership jointly with Mr. Hugh Owen, while Dr. E. J. Evans and Mr. (afterwards Sir) Lewis Morris became Secretaries of the Committee, and Mr. G. E. J. Powell presented his art treasures and valuable books which still form an important part of the equipment of the College. About this time (1879) Professor Genese succeeded Professor Grimley, Professor Humpidge followed Professor Keeping, and Professor McCallum was appointed to the chair of English created a short time previously, and then held by Mr. Craig.

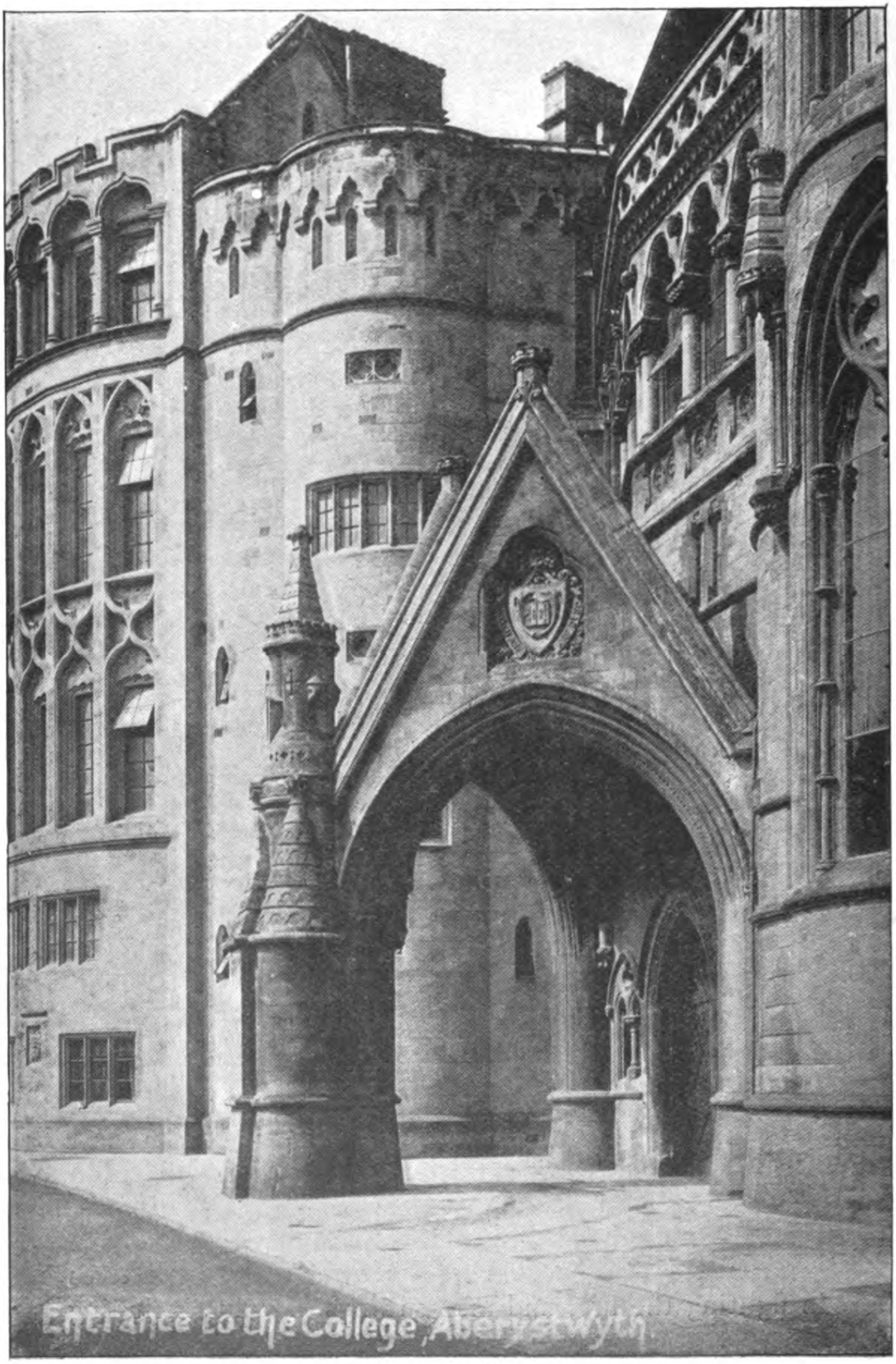
Sir Hugh Owen died in 1881 when the fate of his devoted labours was still doubtful, but a Government Committee was considering the needs of Intermediate and Higher Education in Wales, and the future looked more hopeful for a little while.

In 1882 the Committee reported, and the Government agreed that there should be a College at Cardiff or Swansea for South Wales, and that the Aberystwyth institution, whether removed elsewhere or not, should be the College for North Wales. Aberystwyth received a first annual grant of £4,000 for the year 1882, but a Conference was subsequently held at Chester to further

consider the question of the site of the College, and the majority at this Conference voted against the recognition of the College at Aberystwyth with the result that the University College of North Wales was opened at Bangor.

The Government Grant passed to the new institution and Aberystwyth was in danger again. At this crisis Mr. Stuart Rendel, M.P. (now Lord Rendel of Hatchlands, President of the College) made great efforts to get the case for Aberystwyth fairly stated, and Mr. David Davies promised liberal support even if the Government Grant should be finally withdrawn. Those who had worked for the College through its earlier struggles now came forward again, and the stories of their efforts are a part of the College tradition. The result was that a debate was initiated in the House of Commons by Mr. Stuart Rendel, and the Government soon afterwards agreed to give £2,500 per annum. Mr. Rendel and his helpers were, however, not satisfied with this, and the next year (1885), the College obtained the same grant (£4,000) as its younger sisters in North and South Wales. The Constitution of the College was revised at the same time, and in 1889 the Charter of Incorporation was granted with recognition of the old title of " The University College of Wales, Aberystwyth." The negotiations to this end were supported by Lord Aberdare, President of the College, Mr. T. E. Ellis, M.P. for Merionethshire and an old student, and by the Principals of the Colleges at Bangor and Cardiff.

This event may be said to have closed the first period in the history of the College, the period of its struggle for recognition, but its existence had meanwhile been endangered by the calamity of a great fire on July 9th, 1885, which gutted the main building, doing damage estimated at £20,000. Three workmen lost their lives in fighting the fire, and many things of value including



UNIVERSITY COLLEGE OF WALES—ENTRANCE.

research notes and manuscripts were lost, but, fortunately, the Powell treasures and many of the museum specimens were saved, though, of course, in total disorder.

To cope with this new difficulty the Queen's Hotel was engaged as temporary College premises, and rooms of all kinds in the town were lent for use as Lecture Halls, while the Authorities were cheered by receiving at this crisis the news that the Government Grant had been raised to £4,000 per annum, as already stated. An important step was also taken in opening a Hall of Residence for Women Students, to which Miss E. A. Carpenter came as Lady Principal in 1887, a year sadly marked, on the other hand, by the death of Professor Humpidge.

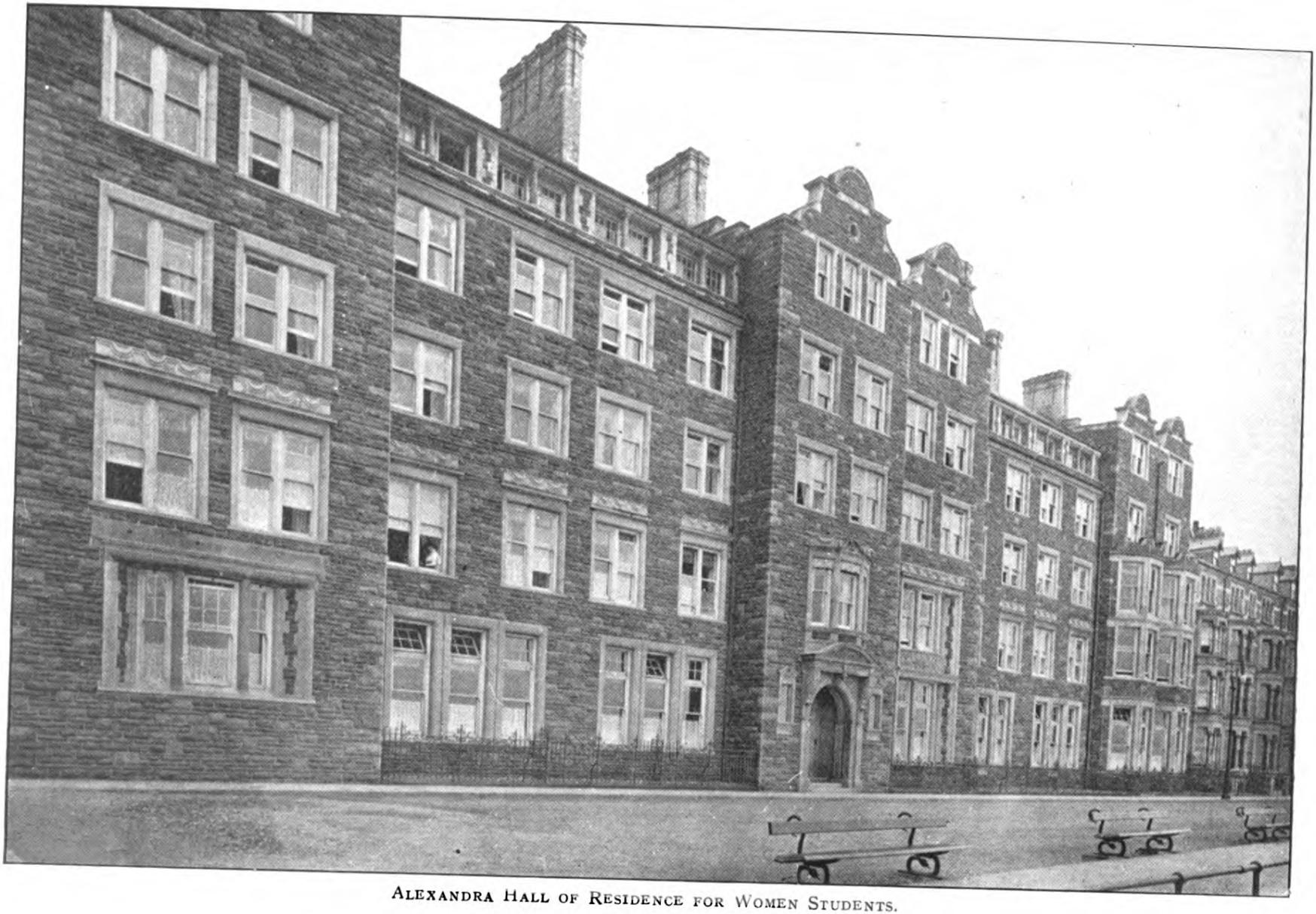
In 1890 Mr. David Davies died, and the College lost a most stalwart and munificent friend, but he had been more fortunate than his Co-Treasurer, Sir Hugh Owen, for he had lived to see the result of their joint labours in the final settlement of the College on a sound and progressive foundation. This year was also marked by Principal Edwards's last great scheme for his College; he paid a visit to America and received from the Welshmen of that continent a gift of about £1,200 which was used for furnishing and fitting the library, now the handsomest and best equipped room in the building. In the following year Principal Edwards resigned his great task in view of advancing years, and his resignation was received with universal regret. He had held office for nineteen years and had piloted the College through many difficulties, finally leaving it to his successor soundly established and ready for further development on University lines. His influence had spread even beyond Wales, and, of the students trained under him, many have reached positions of influence and leadership, while the names of some are, like his own,

household words for the part they have played in shaping the development of the national life of Wales. Mr. T. F. Roberts, M.A., a former student, was appointed as successor to Principal Edwards, and he continued the work of his predecessor and teacher.

The next step was the organisation of a University for Wales, and Sir Hugh Owen's dream was realised when the Charter was granted in 1895 to the federation of the three Colleges of Aberystwyth, Bangor and Cardiff. The then Prince of Wales (His late Majesty King Edward VII.) accepted the Chancellorship and he was installed at the first Graduation Ceremony held at Aberystwyth in June, 1896. Her Majesty Queen Alexandra accepted the degree of Doctor of Music, and among the other recipients of honorary degrees of this great occasion were the late Right Honourable W. E. Gladstone and the late Right Honourable the Earl Spencer.

At the next Degree Ceremony of the University, held in its turn at Aberystwyth in 1898, an honorary degree was conferred upon ex-Principal Edwards, in recognition of his great services to the University life of Wales.

These years were marked by the growth and consolidation of University work at Aberystwyth, and the vigour and independence which were the outcome of years of struggle against adversity showed itself in the organisation of a strong corporate life within the College amongst students and staff, and in the constant and practical support given to the College by its old students. These are perhaps among the most distinguishing characteristics of the institution, and the Old Students' Association, founded in 1892 with Mr. T. E. Ellis, M.P., as its first President, has been a source of pleasure for many years during the Annual Reunions at Aberystwyth every Easter and a rallying ground for the support of the College in its struggle for extension on University



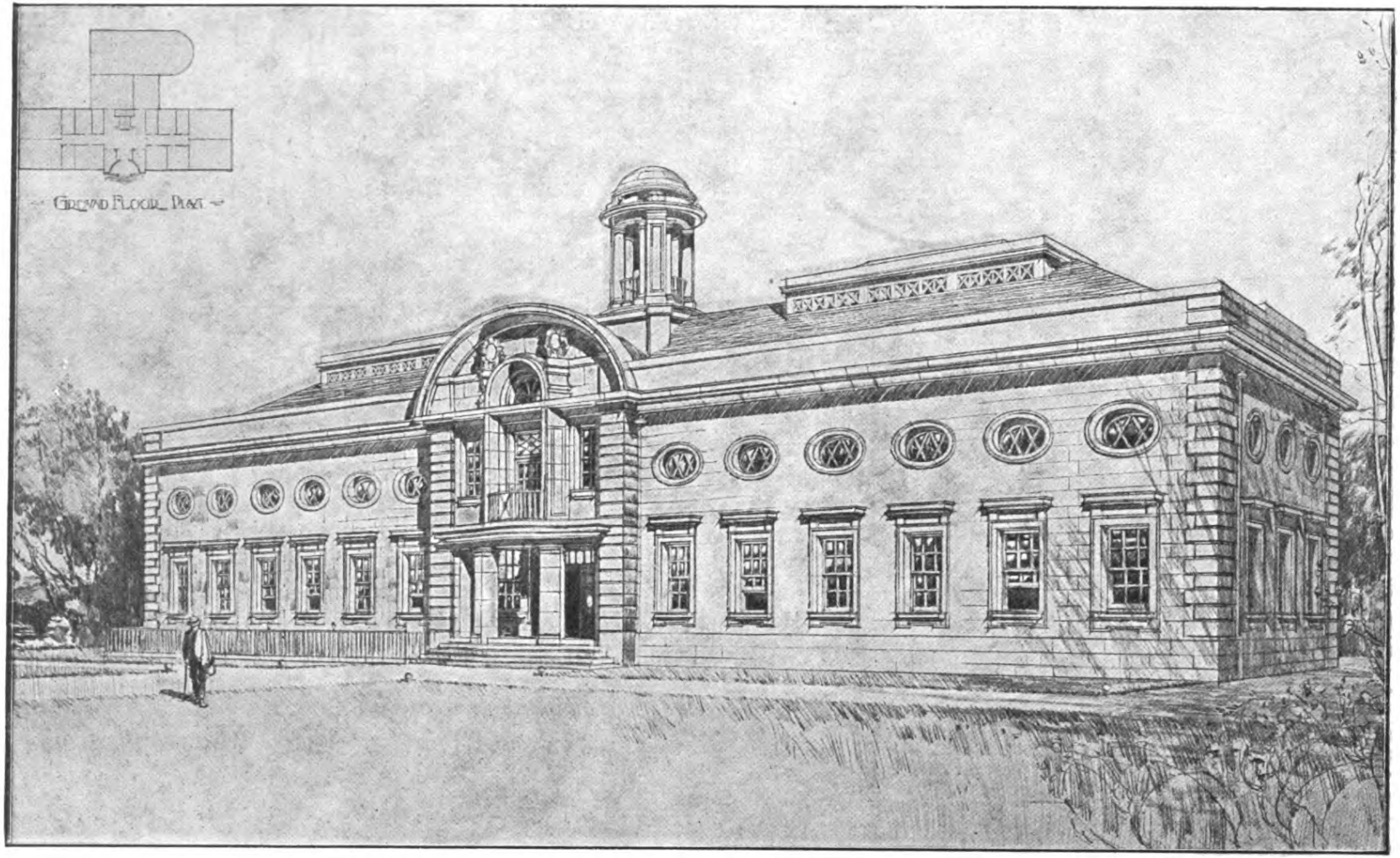
ALEXANDRA HALL OF RESIDENCE FOR WOMEN STUDENTS.

lines. The first old student to join the staff was Mr. D. E. Jones, appointed Lecturer (and later, Professor) in Physics in 1884, and the policy of appointing old students has been developed with great success till now twenty-one out of forty-six members of the Staff come under this category.

In 1896 Her Majesty Queen Alexandra opened the large Alexandra Hall of Residence for Women Students, and in 1898 Sir William Harcourt opened the Central Block, as a building devoted mainly to the Natural History Sciences. He had given a public grant of £10,000 towards this scheme while Chancellor of the Exchequer in 1894.

The need of land for extensions was now becoming serious, and in 1897 Lord Rendel bought 14 acres of land called "Grogythan" to provide room for possible new buildings and for the National Welsh Library, another of Sir Hugh Owen's schemes which was approaching its fulfilment. The number of students was meanwhile growing apace, and the corresponding growth of the Staff made the financial question serious, but here again Lord Rendel stepped in and contributed £750 per annum towards the maintenance of the College and £250 towards scholarships for the pupils in the county schools of Merioneth, Cardigan and Montgomery. The eleventh annual sum of £1,000 under this great benefaction was paid in October, 1910.

The development of the department of Chemistry in the direction of research made extension imperative, and a new temporary laboratory was opened in the Old Assembly Rooms, but the difficulties under this head were removed a little later by the magnificent gift of new laboratories erected on land bought by the College on Buarth Mawr. The donors were Mr. David Davies, Mrs. Edward Davies, and the Misses Davies of Plasdinam, and the gift of over £20,000 is in memory of the late



EDWARD DAVIES MEMORIAL LABORATORIES.

Mr. Edward Davies, who had succeeded his father, the late Mr. David Davies, M.P., as Joint Treasurer of the College. Music became a department recognised by the University in 1899 and a Department of Law was organised in 1901. With the help of the Law Society, lecture courses are arranged not only at the College, but in various South Wales centres.

In 1902 Mr. Penry Vaughan Thomas, a student of the College, promised, jointly with members of his family, the sum of £1,000 towards the equipment of a College Gymnasium. The Old Students' Association raised a further £450, and Mr. Thomas generously increased his great gift, with the result that a finely equipped Gymnasium is now in regular use, under the charge of an instructor who trains intending teachers for a qualifying certificate in Physical Culture. The further provision of athletic equipment was thereby made more hopeful, and the student organisations had by this time gained sufficient strength to contemplate undertaking the responsibility for leasing a field, when Mr. David Davies assisted by purchasing and levelling the Vicarage Field on the understanding that rent should be paid to him which would be devoted to the maintenance of a Professorship of Colonial History in the College. This scheme has been successful, and the College now possesses three playing grounds for hockey and football, besides space exclusively devoted to tennis courts, of which twelve have been laid down, and a bowling green. This, with the Gymnasium on the same ground, provides splendidly for the exercise needed by both men and women students.

Another scheme which has been brought to a successful issue is that for a National Welsh Library at Aberystwyth. This ideal of the pioneer supporters of the College was brought within the range of possibility by the devotion of Sir John Williams, who has collected

manuscripts and books for many years until his collections have become a national library in themselves. They were munificently offered to the National Library if it should be placed at Aberystwyth, and this was a decisive factor in choosing a site. The library is to be built on Grogythan and is temporarily housed in the Old Assembly Rooms, where it is already proving a focus for the research work of students and staff of the College alike.

There are now about four hundred and sixty students in the College, more than twenty of whom are engaged in research, while the amount of advanced work of all kinds done in the College is rapidly increasing, and the provision of equipment and the endowment of lectureships in this connection is becoming a serious need. The Agricultural Department, founded in 1891, is becoming an important factor in the farming industries of the district, and schemes for its further development are now under consideration. The fuller display of the Powell Art Treasures and the provision of a College Museum, as well as Departmental Museums in connection with all possible studies, is another line of development, while the Library organisation has been improved and a Science Library set apart. In 1909, as a result of the favourable report of a Government Commission, the annual grant to the Welsh Colleges was raised to £8,000 each, and this has made it possible to give more adequate recognition to the labours of the staff and, at the same time, to bring income and expenditure nearer to the same level. The College is still saddled with a burden of debt from the lean years of the past, and the removal of this drag on its growth is one of the most practical objects of its present policy.

The Elementary and Secondary Teachers' Training Departments

The Day Training Department was opened in 1891 for the admission of sixty students. Since then, the numbers have been raised to a maximum of 154, being men and women students in approximately equal number. The first Master of Method and Professor of Education was Mr. H. Holman, M.A., who resigned in 1894 on his appointment as one of H.M. Inspectors of Schools, and was succeeded by Professor Foster Watson, M.A. Amongst the former members of the staff of the Department have been two old students of the College, namely, Mr. D. R. Harris, now Principal of the Bangor Normal College, and Mrs. Silyn Roberts, formerly Miss Mary Parry. The present Normal Staff, in addition to Professor Watson, includes Miss Amy Kimpster, Normal Mistress, and two former Normal students, Mr. C. R. Chapple, M.A., Assistant Normal Master, and Miss Maggie Dalrymple, B.Sc., Assistant Normal Mistress. The Superintendent of the College Gymnasium, Mr. C. P. Clayton, B.A., is also a former Normal student.

All students admitted to the Department have, for many years, been required to matriculate before entry, and to pursue a three years course with a view to graduation in the University of Wales.

Many of the ablest students of the College have been Normal students, including Miss E. Abadi (now Mrs. Benjamin), formerly Headmistress of the Jews' Free School, Spitalfields, E. ; Mr. H. W. Bourne, B.Sc., Headmaster of Holy Trinity School, Wolverhampton ; Dr. E. C. Chappell, Headmaster of Spalding Grammar School ; Miss May Copsey, B.A., Lecturer at Clapham Day Training College ; Miss A. S. Fage, B.A., Mistress of Method at the Hartley University College, Southampton ; Mr. Jenkin James, M.A., Director of Education

for Cardiganshire; Mr. A. J. Jones, B.Sc., Ph.D., Inspector under the Welsh Department of the Board of Education; Mr. E. O. Lewis, D.Sc., Demonstrator in Experimental Psychology in the University of Cambridge; the Rev. A. W. Parry, M.A., B.Sc., Principal of Carmarthen Training College; Mr. C. A. Pease, B.A., Headmaster of the Garden City Elementary School, Letchworth; Dr. Horace E. Piggott, Headmaster of the Hornsey Higher Elementary School, Middlesex; Mr. T. J. Rees, B.A., Director of Education to the Swansea Education Authority; Dr. Ivor Thomas, H.M. Geological Survey; Dr. G. Prys Williams, Inspector under the Welsh Department of the Board of Education, and a large number of other teachers who occupy important positions in Wales or in other parts of the United Kingdom. Since 1903, twelve Normal students have obtained first class Honours in the Final B.A. or B.Sc. Examinations of the University of Wales.

The teaching practice in connection with the Department is carried on in the Primary Schools of Aberystwyth and the district, and also in September of each year in the schools of Swansea.

The Secondary Training Department of the College is recognised by the Board of Education as a Training College for Secondary Teachers, and is in receipt of a special Secondary grant from the Board of Education. The Secondary teaching practice is carried on in the County Schools of Aberystwyth, Towyn, Machynlleth, Tregaron, Newtown and Welshpool, and also for women teachers in the Shrewsbury High School.

The work of both these departments is greatly assisted by the special opportunities of instruction in Geography and Physical Training which have recently been provided. A temporary grant in aid of the instruction in Geography has been received from the Royal Geographical Society, and a collection of apparatus for teaching Geography on

modern lines has recently been presented to the College. A special College certificate in Geography is granted to teachers who have followed the course prescribed and passed the corresponding examinations.

A special College certificate of proficiency is also granted in Physical Training to Normal students and other intending teachers who have followed the prescribed course in the new College Gymnasium, reference to which is made in another part of the Souvenir.

THE UNIVERSITY COLLEGE OF WALES AND AGRICULTURAL EDUCATION

By C. BRYNER JONES, M.Sc., Professor of Agriculture in the University College of Wales.

THE counties of Mid- and South-West Wales, for which the University College at Aberystwyth is the centre for higher education, and from which it draws the majority of its students, are almost entirely agricultural. While other industries flourish in certain districts within this area, their importance is relatively so small that they do not appreciably affect its character. Since the adaptation of their education to industrial needs, and especially to the particular needs of their own districts, has become a part of the settled policy of institutions of university standing in this country, it is fitting that in the district served by the University College of Wales, some provision should have been made to give instruction in the scientific principles of agriculture. Such a provision has duly been made, and for twenty years the College has numbered among its departments of study one entirely devoted to agriculture.

It is little more than twenty years since the modern development in agricultural education began in this country. The movement had its origin in the appointment by the Government, in response to the wishes of the friends of agriculture, of a Departmental Committee to consider the question of agricultural education in all its aspects. In the year 1888, the Committee issued their

Report, in which they expressed themselves in favour of State aid being given for the establishment of local centres for agricultural education, and almost immediately, the Agricultural Department of the Privy Council took steps to carry out their recommendations.

The movement in favour of the establishment of an Agricultural Department in connection with the University College of Wales was inaugurated in 1890, and it resulted in the Board of Agriculture, which had meanwhile been established and entrusted with the duty of developing higher education in respect to agriculture, making a grant to the College authorities in respect of session 1891–2 of £250 for the purpose. The College has thus the distinction of being amongst the first of the Universities and University Colleges of England and Wales to take advantage of the aid for this special object offered by the State.

The Aberystwyth College, however, had made earlier efforts than this to identify itself with the cause of agricultural education. As far back as 1876, arrangements were made by the College Council, in consequence of a gift made by Mr. Henry Parnall, for two courses of lectures on the principles of agriculture to be delivered by Professor Henry Tanner, a well-known teacher and the author of a number of text-books on agricultural science. These courses, one of which was intended for school teachers, were given during the session 1877–8. The following session, Professor Buckman, of the Royal Agricultural College, Cirencester, was appointed to deliver a course of lectures on Rural Economy at the College. These courses, however, were not attended with sufficient success to justify their continuance, although they led to some interesting results, and the work thus begun had unfortunately to be abandoned. No further efforts were made till 1890, when as already indicated, definite steps were taken for the establishment

of an Agricultural Department at the College. In 1891 a lecturer in agriculture was added to the permanent staff of the College.

The work of the Department has not been confined to the systematic teaching of students attending classes at the College, but from the outset has lain largely outside the College walls. Its aim, indeed, has been, not only to give facilities to students for the study of agriculture and the sciences bearing upon it, but to give instruction and assistance, by means of popular lectures and other methods, to those actually engaged in farming as well. The Agricultural Department thus differs from the other departments of the College in having a large amount of out-college, or extension work, forming an important and an integral part of its regular work. In this respect nearly all agricultural departments of Universities and University Colleges are modelled on the same plan, and conduct their work in association with the county councils. This arose from the passing of the Customs and Excise Act of 1890, which placed a large amount of money in the hands of county authorities for the purpose of technical instruction, including instruction in agriculture, and the policy of the Board of Agriculture in establishing a number of " centres " in different parts of the country, to which should be affiliated, for the purposes of agricultural education, a group of adjoining counties in each case. In accordance with this arrangement, the University College at Aberystwyth became the centre, in respect of technical instruction in agriculture, for a large area, consisting of the counties of mid and South-west Wales.

At first the work of the Department consisted of dairy demonstrations arranged at various local centres, and work of a purely pioneer kind, which was intended to enlist the sympathies of the agricultural community with the ultimate object in view. A complete scheme

was, however, soon formulated including special courses for agricultural students in the College. The first prospectus of the Department was issued for Session 1891–2. During that session, an assistant lecturer was appointed in agriculture, as well as an assistant lecturer in agricultural chemistry. The following year, the seven county councils in the College area made grants amounting to a total of about £1,150 towards agricultural work, which was to be carried on by the College. This money was applied to extension lectures to farmers, travelling dairy classes, classes for school teachers, and, in the case of Cardiganshire and Carmarthenshire, to a number of Scholarships to enable students to take advantage of the classes held at the College. The work of the Department, both in the College and in the counties forming the area of its operations, was thus begun on systematic lines, and has continued up to the present. The affiliated counties still make grants of varying amounts towards the work, but in consequence of the demands of other forms of education, there has been in some cases a tendency in recent years to reduce the sums devoted to purely agricultural education. This, while it has limited the scope of the extension work carried on by the College, as originally designed, has not prevented the development of that work in other and perhaps equally effective directions.

The Board of Agriculture Grant was increased in 1892–3 from £250 to £500, and in 1894–5 to £800, which is the maximum annual grant made by the Board. Since 1895, the Department has continued to receive this grant, which is its main source of income. The in-college work of the Department, which at the beginning was naturally limited, steadily increased, and additions were made to the staff. Various courses of a practical character, and varying in length, were arranged in the different branches of dairying, which, as being

an important industry in the affiliated counties, received special attention from the first. In 1893–4, a permanent dairy school was established at the College, and every year since a number of pupils have been sent to the school from different counties with scholarships. A large number of pupils have thus passed through a course of training in what is in most parts of Wales an extremely important branch of the farming industry. Special short courses of instruction were also instituted for farmers' sons and others actually engaged in farming. Meanwhile, what may be described as the higher work in agricultural education was also being developed. Courses extending over two years, and corresponding to the diploma courses of other institutions had been arranged, and were attended by students desiring to qualify for various agricultural appointments. With the establishment of the University of Wales, agriculture was recognised as a department in which students could take a degree, and in 1897–8, a three-years' course was arranged for the degree of B.Sc. in Agriculture. In 1899, horticulture was added to the subjects in which the College undertook to conduct extension work, and an instructor in that subject was appointed. A garden had been used by the College for some time for the purpose of giving demonstrations on a small scale to students. In 1903, a conference of representatives of the various counties in the College area was arranged to consider the question of acquiring a farm for the purposes of the Agricultural Department, and in the following year, a farm of about 200 acres was taken, and has since been a part of the equipment of the Department.

In the above outline of the growth of the Agricultural Department of the College from its beginning, enough has been said to furnish a general idea as to its aims and the scope of its work. It has been shown that, from

the outset, the College has worked as regards agricultural education in close association with the county authorities, and that the scheme of work has embraced not only the instruction of students within the College, but also the education, in so far as that means the dissemination of scientific knowledge, of the farming community generally within the area. A brief description of the work in progress and of the facilities offered by the Department at present will show at once the nature of the general provision for agricultural education made by the College.

The counties forming the College area are Cardigan, Carmarthen, Pembroke, Brecon, Radnor, Montgomery, and Merioneth. A certain amount of money is set aside annually by the Education Authority in each of these counties, and is allocated, in accordance with a general scheme formulated in conjunction with the College, roughly under the following heads, viz. : (*a*) courses of lectures on agriculture and veterinary hygiene to farmers at local centres within the county ; (*b*) courses of lectures and demonstrations in horticulture ; (*c*) courses of instruction in dairying ; (*d*) courses of instruction in the management of poultry ; (*e*) scholarships and exhibitions tenable at the College ; (*f*) maintenance of the College Farm ; (*g*) field experiments and demonstrations in the county. The total sum expended in each county varies greatly, as does also the work to which the money is devoted from year to year. The whole of the work in the counties is carried out by the staff of the Agricultural Department. Lecturers, instructors, and instructress are employed by the College, whose time is partially or wholly devoted to this work. The greater part of the county work is conducted during the winter months, when it is easiest for farmers to attend lectures and meetings generally. Dairy and horticulture classes, however, are held at

other seasons of the year, and field demonstrations are conducted mostly in the summer. The lectures on agriculture are generally given weekly, as are also those on veterinary hygiene, and usually consist of four in a course. During the last two or three seasons, however, an effort has been made to give more systematic instruction even outside the College, and several courses of ten lectures each have been given with great success. The attendance at the lectures is generally very satisfactory, and ranges from 20 to 150. The lectures serve not only as a means of disseminating information, but also to bring the Agricultural Department into a close relationship with farmers, who take advantage of the presence of the lecturer to discuss with him the many topics in which they are mutually interested. The courses in horticulture, poultry management, and dairying, usually extend over a fortnight at each centre, lectures being given in the evenings and practical demonstrations in the afternoons. In connection with the horticulture classes, a great deal of work has been done in recent years in association with the elementary schools. This has mainly consisted of general nature study, and the laying out and supervision of school gardens. Some work has also been done in connection with the intermediate schools, and this, as well as the work in the elementary schools, is expected to lead to very valuable educational results in the future. The linking up of the work of the schools to that of the College will play an important part in the future development of the Agricultural Department. The field experiments and demonstrations include trials with different kinds of manures and seeds, and of various methods of dealing with plant diseases and pests. The results of the trials are recorded, and distributed in printed form. Farmers may have advice on all matters relating to agriculture free of charge by applying to

the Department, and much valuable work is regularly done in this way.

The in-college courses which students may pursue include (*a*) the three-years' course for the degree of B.Sc. in agriculture; (*b*) a diploma course extending over three winter sessions, and adapted more directly to the needs of those who desire to become farmers, land agents, valuers, etc.; (*c*) short courses intended mainly for farmers' sons who are themselves engaged in farming; (*d*) a diploma course in dairying, extending over two years; and (*e*) short courses in dairying, corresponding to the short courses in agriculture.

As bearing more directly on the relation of the in-college work to that carried on in the counties, the short courses in agriculture and dairying are of the greatest importance. For the former, a number of young farmers ranging from thirty to forty are sent to the College each session with scholarships. They spend two months at the College during the autumn term, and follow a course of instruction which is specially arranged to meet their requirements. Provision has been made by some of the counties by which the best of these students may return with scholarships for a further course of a more advanced character. Moreover, the courses have been so arranged by the College that one leads to the other by easy gradations, and a student who begins by taking the elementary short course may finally take the College Diploma. Some hundreds of young farmers in the affiliated counties have passed through one or more of these short courses, and are now of immense assistance to the College not only in carrying out experiments, and as local correspondents, but also in directing public opinion in their respective districts to the advantage of agricultural education. The same may to a great extent be said of the short courses in dairying. Some years ago the agricultural students of the College formed themselves

into an Association with a view to providing themselves with opportunities for discussing agricultural matters, and of keeping themselves in touch with the College. The Association has now a membership of over 300. Meetings are held twice a year, and prizes and medals are offered for essays, for the best conducted experiments, and other matters of interest to agriculturists.

It is not within the province of the College to give instruction or direction in the purely commercial side of agriculture, nor to teach " farming " in the ordinary sense of the word. It makes no attempt to do this. It is, however, of the greatest importance that the agricultural student should be given facilities for familiarising himself during his course with the method of conducting ordinary farm operations. It was partly for this purpose that the College Farm was acquired. The farm is visited regularly by the agricultural students during their residence at the College, and the relation of science to practice is always kept before their minds. In addition, the farm is used for conducting experiments on crops and live-stock, the results of which are published for the benefit of the farmers of the district, many of whom visit the farm from time to time for purposes of inspection.

The part that the College has taken in connection with agricultural education is an important one, and its efforts have not been unappreciated. It may be safely said that the Agricultural Department has been able to benefit the agricultural community, directly and indirectly, to an extent that is difficult to gauge, and although its work may develop in other and different directions in the future, its value and influence will doubtless increase.

ST. DAVID'S COLLEGE, LAMPETER

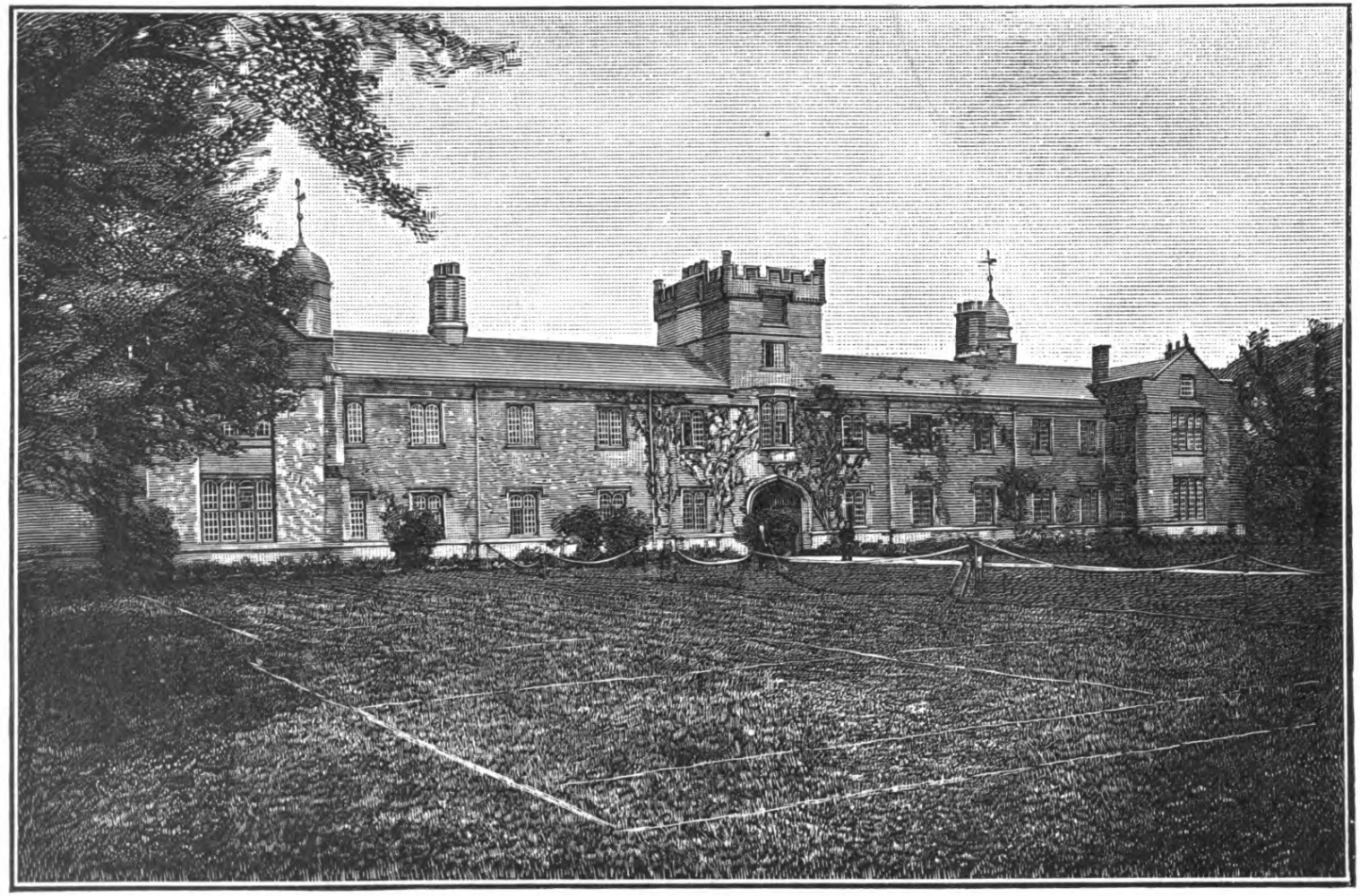
By The Rev. Ll. J. M. Bebb, M.A., D.D., Principal of the College, and Prebendary of St. Davids

The foundation of St. David's College, Lampeter, was due to the enterprise and energy of Thomas Burgess, Bishop of St. Davids (1803–1825). Begun in 1822 and opened in 1827 it was one of the first University Colleges outside Oxford and Cambridge, and the life and courses of study have always been modelled on those of an Oxford or Cambridge College.

The buildings stand in about ten acres of grounds and contain the usual equipment of a residentiary college intended for the promotion of " true religion and sound learning." The steady increase in numbers has, however, made necessary the provision of further accommodation both in the way of students' rooms, and in enlarged public rooms.

The architect of the original block of buildings was C. R. Cockerell, a prominent architect of the day, who designed the Royal Exchange, London and the Taylor Buildings at Oxford, to name only two of the many works with which he was associated. A later addition was made in the detached block known as the Canterbury Buildings begun in 1885, and opened in 1887. These contain students' rooms, excellent lecture rooms and a laboratory.

The hall contains good portraits of the Founder, of the first Principal (Dr. Llewellin) and of some of the many distinguished men who have been connected with the



St. David's College, Lampeter.

staff of the College. Among these may be mentioned Bishops Harold Browne, Ollivant, and Perowne, and the present Bishops of Chester, St. Davids and Winchester.

The chapel which was re-arranged in 1880 from plans by Mr. T. G. Jackson, R.A., contains a copy of Coreggio's picture of *The Madonna of St. Jerome* at Parma, which is said to be by a pupil of Coreggio.

The main library is a handsome room containing many MSS., early printed books, first editions, rare tracts and pamphlets and other treasures, some of which are exhibited in show cases, though want of space prevents full justice being done to the collection. The number of volumes is estimated at more than 50,000.

The Welsh library contains a large number of books and periodicals in Welsh or relating to Wales. Especially noteworthy is a fine collection of Welsh hymns and ballads from the library of the late Rev. D. H. Davies, vicar of Cenarth.

The staff consists of nine professors and lecturers, and in the Michaelmas term of 1910 the students numbered 151.

The College has been described as a University *in petto*. (It has by successive Royal Charters been granted the power of conferring the degrees of B.A. and B.D.). It is open to students of any nationality and enforces no religious test. It was founded to give students preparing for ordination, as far as possible, the advantages of a University education without the (to many) prohibitive cost of life at the older Universities, and most of its students come for such preparation. But its special courses offer a good preparation for the Civil Service and other professions. The Degree Courses cover a period of three years. In addition to the course for the Pass Degree, there are Honour Courses in Theology, Classics, Mathematics, Science and Welsh. Candidates taking these courses are admitted to exceptional privileges in

respect of examinations and length of residence as " affiliated students " at Oxford and Cambridge.

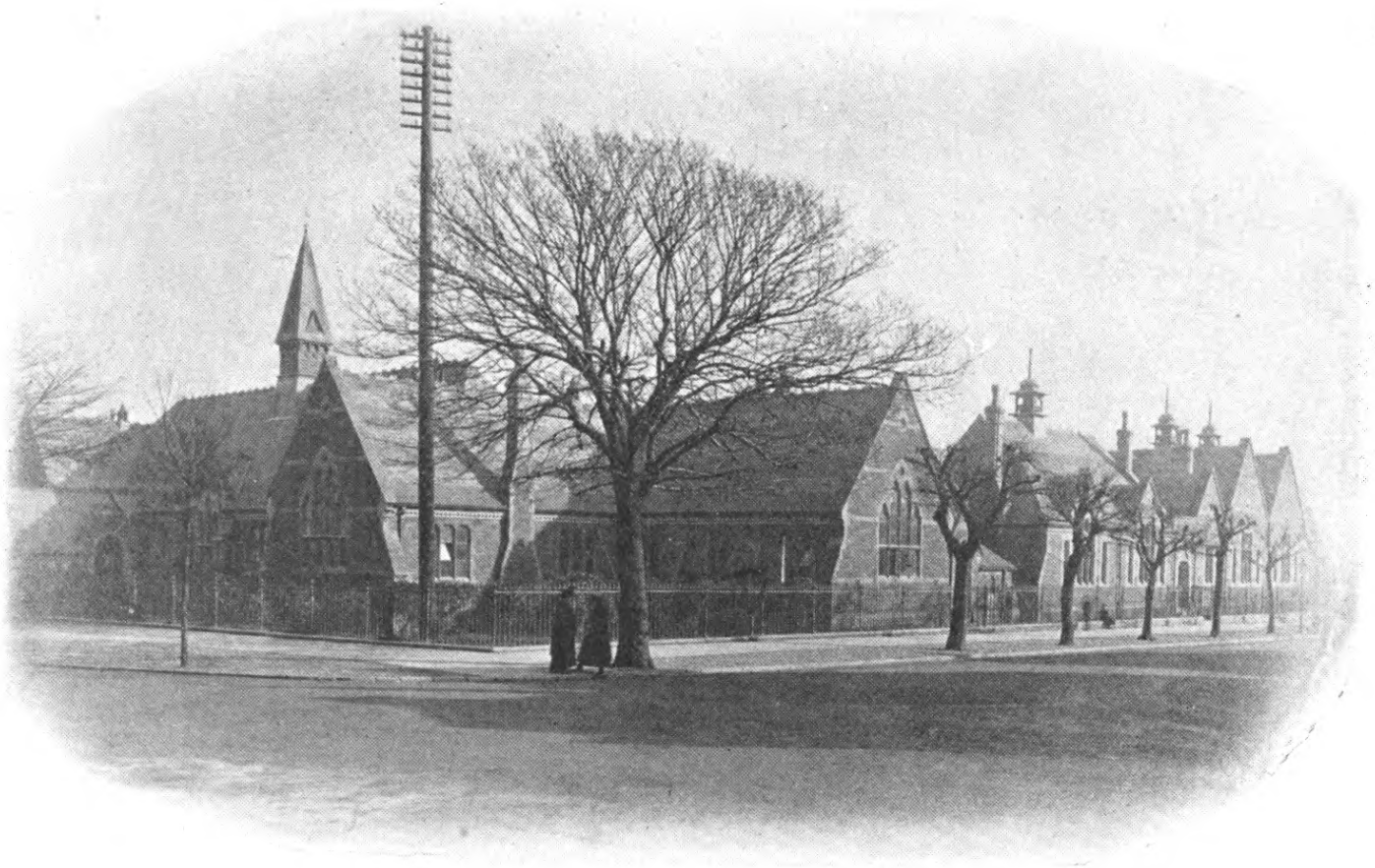
The College is well endowed with scholarships, the examination for which is held in the autumn, and has also a fund for making annual grants to students proceeding to Oxford and Cambridge.

Side by side with the Degree Courses there is also a Two Years' Course for non-graduates.

EDUCATION IN CARDIGANSHIRE— ELEMENTARY AND HIGHER

By JENKIN JAMES, M.A., Director of Education

READERS of this Souvenir do not require to be told that Cardiganshire is among the smallest of the counties of England and Wales. The Census of 1901 showed a population of 61,078, a figure which, as a result of a steady process of depopulation, is now considerably less. The county area covers some 440,000 acres, and its rateable value amounts to £231,888, which is equivalent to a 1d. rate of £966 4s. The total number of children under instruction in the Public Elementary Schools of the county was on September 30th, 1910, 9,892, and the average attendance for the year ended March 31st, 1910, was 8,484. The number of Public Elementary Schools is 106, consisting of 84 Provided and 22 Non-Provided Schools. It will be observed that the number of Non-Provided Schools is unusually large for such a small area ; in fact, there are only three Welsh counties, viz., Carmarthenshire, Carnarvonshire and Glamorganshire, with a larger number of Council Schools. The county area being a very scattered one, it follows that the majority of the schools are very small rural schools. Out of 106 schools representing 113 departments there are only 24 with an average attendance exceeding 100, while in the case of 50 schools the average attendance is less than 60. The largest schools are, of course, to be found in the town of Aberystwyth, where the Council



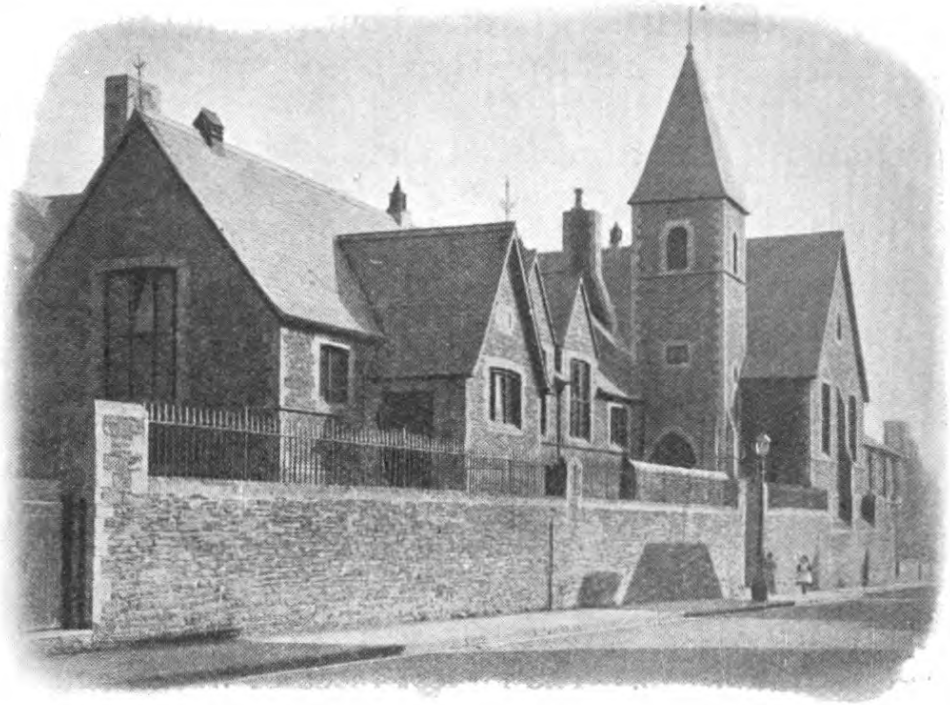
ALEXANDRA ROAD COUNCIL SCHOOL, ABERYSTWYTH.
(ACCOMMODATION 835).

School with three departments has an average attendance of 688, and the Church of England School with two departments has an average attendance of 324. It may be stated here that these two schools are used as Practising Schools in connection with the Day Training Department of the University College of Wales, Aberystwyth. There is also a fairly large Council School of three departments at Cardigan in the extreme end of the county, with an average attendance of 324. With these exceptions, Cardiganshire is a county of small rural schools working under conditions which are in all respects typically rural.

The educational interests of the county are looked after by an unusually large body, the Education Committee of Cardiganshire consisting of all the members of the County Council, sixty-four in number, with ten co-opted or selected members in addition. Of these latter, three are nominated by the County Association of Teachers, the other co-opted members representing Higher Education in its different aspects. It should be mentioned that five of the co-opted members must be women. As in many other counties, it has been found necessary to constitute smaller bodies called District Committees acting under the control and superintendence of the Central Committee. There are six of these District Committees, each Committee consisting of all the members of the Education Committee residing within the particular district. In addition to these Committees there are bodies of managers responsible for groups of schools, the Clerk of the District Committee acting as clerk to the various bodies of managers within his district.

The Cardiganshire Education Committee is responsible for both Elementary and Higher Education within the county area. The Committee came into existence on September 26th, 1904, when under the provisions of

the Education Act, 1902, it superseded thirty-eight School Boards and also the County Governing Body established under the Welsh Intermediate Education Act, 1889. With the exception of a short period at the commencement, the Committee's proceedings have been presided over by D. C. Roberts, Esq., J.P., ex High Sheriff of the County and Alderman of the Borough of



ABERYSTWYTH CHURCH OF ENGLAND SCHOOL.
(ACCOMMODATION 544).

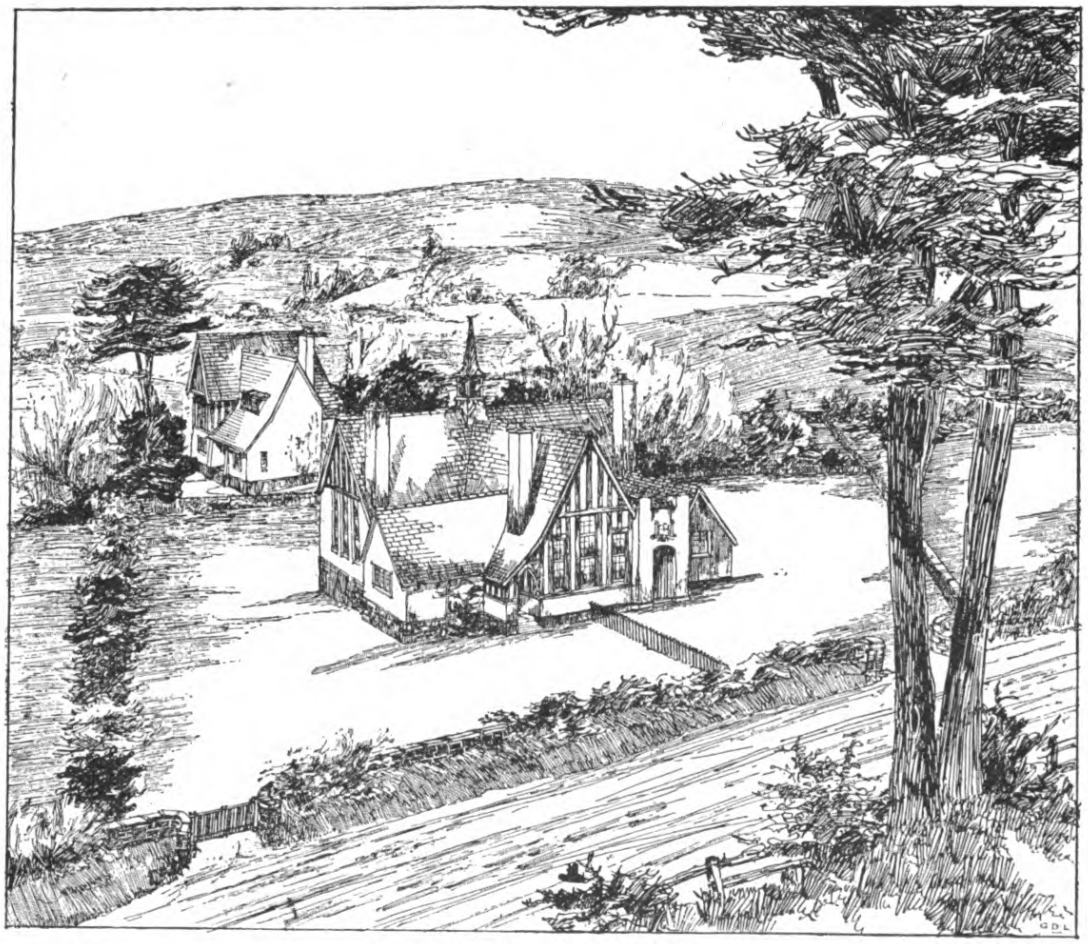
Aberystwyth. He brings to the administration of education a combination of the qualities of keenness, broad-mindedness and a capacity for affairs which has been of invaluable service to the county.

I will now attempt a brief review of the work which has been accomplished since the Appointed Day. First, as regards school buildings. Seven Non-Provided Schools have been transferred to the Education Authority, one new Council School has been erected, and it is

anticipated that before the end of 1911, three other new schools will have been completed. Nearly all the Non-Provided Schools of the county have been overhauled and renovated, the majority of the managers showing no reluctance to carry out the Committee's reasonable requirements under Section (7) (1) (*d*), Education Act, 1902. As regards the Provided or Council Schools, very extensive structural repairs and improvements have been carried out. Owing to legislative changes that had long been impending, and possibly for other reasons also, the late School Boards with a few exceptions had for some years left the structures of the schools entirely untouched. As a result, many of them had fallen into a dilapidated condition, and on the Appointed Day there were few school buildings which did not require immediate overhauling. The Committee undertook the task of putting these buildings in a proper state of repair, quite systematically, and from the beginning adopted the policy of " thorough." The result is that by this time there is hardly a school in the county which has not undergone some structural improvement, while in the case of about fifty schools, repairs and alterations have been carried out on quite an elaborate scale. The largest piece of work has been the erection of the extensive buildings at the Alexandra Road Council Schools, Aberystwyth. The extensions consist of six classrooms, a handicraft room, and a room for cookery and laundry, and in addition the whole school building has been thoroughly renovated. The buildings were formally opened on October 4th 1910, by Alfred T. Davies, Esq., Permanent Secretary of the Welsh Department of the Board of Education. The total expenditure incurred on this work was £6,800.

The above will suffice to show the nature and extent of the improvements to school buildings which have been

carried out during the last six years. It is no exaggeration to say that during this short time the schools of Cardiganshire have undergone a transformation which is without a parallel in the previous history of the county. The school buildings as a whole are now in a creditable condition, and afford a pleasing contrast



LLANWNEN COUNCIL SCHOOL.
(ACCOMMODATION 80).

to the state of things complained of in the Report of the Commission appointed to make an inquiry into the state of education in Wales in 1846. In that Report Cardiganshire is spoken of in the following terms :—

" I found only one completely satisfactory feature in connection with the school buildings, and that was

the ventilation. This was seldom defective, the wind generally blowing freely down the chimney, and through the holes in the doors and windows. In Cardiganshire there is uniformity of barrenness, except at Aberystwyth, which is an oasis in the wilderness."

Aberystwyth still continues to be an oasis—as Conference representatives will discover—but they must not think that it is all a barren wilderness beyond.

Lest the reader should think that in Cardiganshire the school structure receives more care and attention than the teacher, I hasten to add that the Committee has done a great deal to improve the position of the teachers. As compared with the state of things at the Appointed Day, there has been an increase of nearly £4,000 in salaries alone. When it is remembered that this is equivalent to the produce of a rate of 4d. in the £, the Committee deserves some credit for having pursued an enlightened policy in this matter. It is true that the charge has sometimes been made that Cardiganshire has too many Supplementary Teachers, and the charge is by no means without foundation. But it is only fair that before finding the Committee guilty of pursuing a retrograde policy, the critic should give due regard to the following circumstances :—

(1) Most of the Supplementary Teachers now in the county were appointed by the late School Boards.

(2) Most of the Supplementary Teachers now in the county are in charge of the infants' divisions in small rural schools. Many of these have attended summer courses in kindergarten provided by the authorities of the University College at Aberystwyth.

(3) Saturday classes have been established at six centres in the county, to enable Supplementary Teachers to improve their qualifications. These classes were started in January, 1909, so that they have been going on for nearly two years. That

they are bearing fruit, is shown by the fact that fifty Supplementary Teachers from the county sat for the Preliminary Examination for the Certificate in December, 1910.

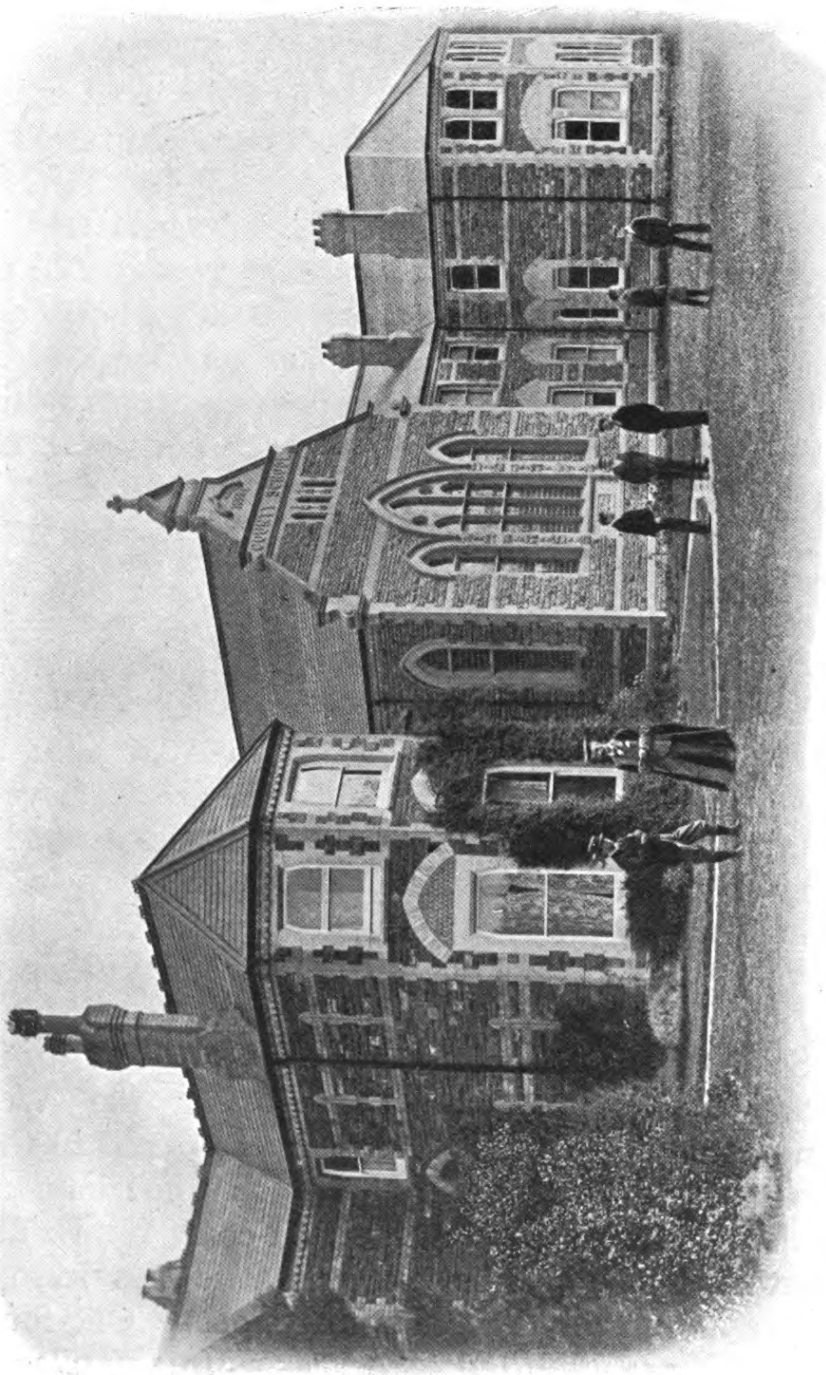
(4) Supplementary Teachers are no longer engaged by the Committee. There has scarcely been a single appointment of a Supplementary Teacher since 1908.

These facts, I hope, will suffice to show that Cardiganshire is no refuge for Supplementary Teachers, and that there is every prospect in the immediate future of a speedy reduction being made in their number.

Cardiganshire is a typical Welsh county. It may, indeed, claim to be the most rural and the most Welsh of all the Welsh counties. The children when they first come to the schools are nearly all monoglots, to whom English is an unknown language. The problem presented to the Welsh teacher in the person of the monoglot Welsh child at his admission to school is the one distinctive feature of Elementary education in a Welsh county such as Cardiganshire. There was a time in the history of Welsh education when the child's knowledge of Welsh was ignored in the supposed interests of English, when, in fact, it was looked upon and treated as an unavoidable evil and an unmitigated nuisance. But by to-day we have found a better method of dealing with the Welsh child. We no longer ignore the child's knowledge of his native tongue, but rather encourage him to use it and to express his ideas by means of it. We teach him to read it, and in fact, for the first two or three years, Welsh is the recognised medium of instruction. He is not introduced into English until he has emerged from the infant stage, and even then only gradually, the instruction at first simply taking the form of conversational lessons. When the child comes to attempt English reading, he finds little difficulty

owing to the phonetic character of the Welsh alphabet to which he has been accustomed. Teachers indeed find that, instead of being a hindrance, the child's previous knowledge of Welsh is a valuable asset in helping him over the difficulties of the English primer. When the child reaches the second standard in the Senior School, the two languages are henceforth taught concurrently, a little more time being devoted to English as the child advances through the school. In all cases where Welsh is the language of the parents, it is the wish of the Education Committee that at the end of their school career Welsh boys and girls should be able to read and write Welsh correctly, and be so equipped as to have an intelligent appreciation of the beauties of Welsh literature.

As regards the problem of adapting and adjusting the curriculum of the Elementary Schools to the life of the community — a problem which is exercising the minds of educationists and of educational bodies throughout the country — the Cardiganshire Education Committee has made some little progress on approved lines. School gardens are encouraged everywhere, and several of these have for some time been in working order. There are many difficulties (originating for the most part with the Regulations of the Board of Education) in the way of subjects such as woodwork, cookery, and laundry being taken in rural schools, but it is hoped that in a few years Cardiganshire will have initiated a scheme whereby these subjects will be taken in the majority of the village schools of the county. Mr. R. E. Bevan, one of the Teachers' Representatives, at a recent meeting of the Committee, called attention to this matter, and urged the necessity, on educational and other grounds, of adjusting the curriculum of the Elementary Schools to the practical needs of life. He also advocated the desirability of instituting experiments



County Intermediate School, Aberystwyth.

in the case of a few selected schools with a view to the adoption of a comprehensive scheme of practical education in the schools of the county. The Education Committee heartily approved of the principle, and it is expected that the result will be the inauguration of some interesting experiments.

There is one other phase of educational activity which has been taken up with considerable enthusiasm in the county. I refer to the establishment of school libraries. The plan adopted by the Committee has been to encourage the formation of school libraries by contributing one half of whatever sum is collected or subscribed locally for the purpose. By getting up school concerts, by soliciting subscriptions and in other ways the head teachers have co-operated most cordially, and the plan has worked so successfully that no less than fifty-seven school libraries have already been established in the county. Wherever libraries have been established, it is the invariable testimony of head teachers that the effect very soon becomes apparent in a greater love of reading, in improved composition and spelling, and in increased intelligence and general knowledge.

I find that the space at my disposal will only permit a very brief account of the provision made in the county for education other than Elementary. As regards Secondary Education, there are in the county five Intermediate Schools established under the Welsh Intermediate Act, 1889. The number of pupils in these schools for session 1908–9 was 665, viz., 392 boys and 273 girls, of whom all except 30 had come from Public Elementary Schools. The tuition fee varies from £4 to £5 per annum at the different schools. One-fourth of the pupils are admitted each year as free pupils, and the schools are recognised by the Board of Education under the Board's Regulations for Secondary Schools.

In addition to the Intermediate Schools there are in

the county two well-known Grammar Schools, viz., St. David's College School, Lampeter, and Ystrad Meurig Grammar School. Both these are ancient foundations with a long and honourable history, and the former is a recognised Secondary School conducted in accordance with the Regulations of the Board of Education.

This article would not be complete without a reference to the question of the training of teachers. As has already been stated, Cardiganshire is pre-eminently an agricultural county. It is not rich in mineral resources, like some other counties in Wales. But poor though it is in other respects, Cardiganshire is rich in raw material for the teaching profession. There is hardly a county in the United Kingdom in which for its size there is a larger supply of good teaching material or where the conditions on the whole are more favourable to the production of teachers. "If a census of those who, in one way or another, find their way into the work of teaching could be made up for a county like Cardigan it would be a striking list."* The list would include such names as Bishop Lloyd, the late Bishop of Bangor, Chancellor D. Silvan Evans, the well-known lexicographer, Sir John Rhys, Principal of Jesus College, Oxford, Principal Owen Prys, Theological College, Aberystwyth, and many other names that could be mentioned. The county seems to possess endless resources in this direction, and as yet the supply shows no signs of exhaustion. This fact accounts for the unusually large number of pupils in the Intermediate Schools, in proportion to the size of the county, and for the success of the scheme adopted by the Education Committee for the training and instruction of intending teachers. Under this scheme twenty scholarships tenable at Intermediate

* Principal T. F. Roberts, U.C.W., Aberystwyth, at the Welsh National Conference on the Training of Teachers, held at Shrewsbury on November 10th and 11th, 1904.

Schools are annually awarded to intending teachers. These scholarships are limited to candidates not exceeding fourteen years of age, and, subject to satisfactory reports, are tenable for a period of four years. In their fourth year the candidates become Bursars under the Regulations of the Board of Education, and in their fifth year they pass on to the schools as Student Teachers.

A brief reference to the facilities offered in Cardiganshire for Education of the continuation type shall bring this article to a close. And in this matter there are few counties that can show better results, as the reader may see for himself by reference to the recently published statistics of the Board of Education for session 1908–9. Though the number of Public Elementary Schools is only 106, there were established in the county during that session as many as 62 Continuation Schools. The majority of the classes are Evening classes conducted by head teachers of day schools and taking the ordinary elementary subjects, but in addition to these there are Day and Evening classes conducted by lecturers on the staff of the University College of Wales, Aberystwyth, in such subjects as agriculture, poultry keeping, cookery and laundry-work. There are also classes in such subjects as ambulance and home nursing, and within the last year there has been a great demand for special courses in music conducted by men possessing special qualifications in the subject. The school library is freely used by the evening scholars, and in remote country villages constitutes a great attraction. The Public Elementary School is thus gradually coming to its own as a social and intellectual centre especially in the rural parts of the county.

LLEDROD AND YSTRAD MEURIG GRAMMAR SCHOOLS

By The Rev. Principal Bebb, M.A., D.D.

Lledrod School was founded in 1746 by Dorothea Oliver, in accordance with the wishes of her late husband, Rev. T. Oliver, and a trust deed directs the use of the endowment "for the educating forty children if such number shall be offered . . . in the principles of the Church of England, and as far beyond the grammar as the master for the time being should be capable of teaching." This school was annexed to Ystrad Meurig during the lifetime of the first trustees. Ystrad Meurig School was founded by Edward Richard, and he was its first headmaster (1745–1777). The indentures in the trust deeds by which the endowment was granted are dated 1757, 1771 and 1774, and the purpose of the endowment is to the intent that there "might be and remain a perpetual grammar school in the said village of Ystrad Meurig for ever." Further provision for exhibitions or prizes was made by the will of the late Daniel Williams.

These endowments under successive headmasters have enabled many, at a time when educational privileges were far more difficult to obtain than they are now, to receive at a very small cost an education preparatory for Oxford and Cambridge and St. David's College, Lampeter. The large number of boys on the books—for Michaelmas term, 1910, it was 65—shows that under its present conditions, which to modern educationalists will seem in many ways antiquated in equipment and in other ways, the school still continues to serve a very useful purpose, while it may look back with satisfaction to the large number of its past students who are occupying responsible posts in Church and State.

ST. DAVID'S COLLEGE SCHOOL, LAMPETER

St. David's College School, Lampeter, has carried on since 1884 the work done by the Old Grammar School of Lampeter, "refounded" by Eliezer Williams in 1805. The old building, on the edge of the churchyard, is still used for educational purposes on week days and Sundays. The College School was established in 1884 in the College grounds at the corner of Station Terrace and College Street, and was adapted and enlarged by the use of already existing buildings. Up to 1910 it was managed by the College Board with the assistance of two representatives of subscribers, but in that year its management was put on a more formal basis at the request of the Board of Education, and the buildings are now leased to a body of governors. Its pupils have largely increased in numbers during the last few years, and now number between eighty and ninety. Many have done well both at Lampeter and also at Oxford and Cambridge, where several old boys hold scholarships and exhibitions.

AN OLD ABERYSTWYTH SCHOOL

JOHN EVANS, born in 1796, at Blaen Plwyf, a village about five miles outside Aberystwyth, was the son of a weaver, and for some time he followed the same occupation. At the age of seventeen, he walked to London, with the object of educating himself. Entering the service of a bookseller, he was brought before the magistrates for selling books without a licence ; but, satisfying the Court that he had broken the law in ignorance, he was liberated. Through the kindness of a fellow-countryman he was sent to the school kept by Griffith Davies, a celebrated Welsh mathematician. Returning to Wales, he taught at Llanfair Caereinion and Welshpool, in Montgomeryshire, and, in his twenty-first year, settled at Aberystwyth, where, for nearly fifty years, he kept the " Mathematical and Commercial School," in a house (now demolished) at the corner of Chalybeate Street and Lewis Terrace. A class in navigation, composed of young men, and older men too, studied in the left room on the ground floor. The other classes occupied the floor above. The master sat at a desk upstairs in front of the window on the left, and a trap-door in the floor enabled him periodically to put his head through to supervise the navigation class in the room below. He made his own telescope, and a sundial (the latter yet preserved, but not in its original position) ; and assisted the teaching of navigation astronomy by the use of a magic lantern. Using books not, even then, of the premier order, he yet turned out brilliant mathematicians, and his navigation school had a wide repute. Among his pupils were Dr. Lewis Edwards, afterwards Principal of Bala Theological College, to whom a statue is shortly

to be erected; Mr. Henry Richard, M.P. for Merthyr and one of the founders of the Peace Society, and of the University College of Wales, Aberystwyth; the Rev. D. Charles Davies, Principal of Trevecca Theological College; Mr. Edward Jones, afterwards headmaster

[*Photo, D. J. Lewis.*

JOHN EVANS' "MATHEMATICAL AND COMMERCIAL SCHOOL," ABERYSTWYTH.

of the Aberystwyth Grammar School; Mr. William Ellis, of Caius College, Cambridge, afterwards of the Dolgelley Grammar School; and his own son, John Evans, M.A., and gold medallist of Edinburgh University. Evans was also a musician, a keen student of Divinity, and a devoted temperance worker.

BILINGUALISM IN THE SCHOOLS

By T. Gwynn Jones

It may be difficult for many people nowadays to realise that, thirty years ago and even less, in the schools of Wales, children were degraded and punished for speaking the Welsh language, though they were utterly unable to express themselves in any other, but the writer happens to have personal experience of that stupid system. The earlier form of punishment is now only remembered by the older generation. It was known as that of the "Welsh Note," and was inflicted, often in addition to corporal chastisement, by means of a piece of wood or cardboard hung with a cord round the neck of the child who dared speak the only language known to him. At a later period, other methods were adopted, such as to cause the child to stand on a bench, with the intimation that, if he called out the name of any other child who had spoken Welsh, he would be allowed to stand down, the punishment ultimately falling upon the last offender. It will be observed that the system was admirably calculated to destroy self-respect and to foster duplicity and cowardice. In most cases, it simply caused the children to detest the schools and all connected with them, and it would be vain to expect ever to find amongst that class anything but utter contempt for the educational aims and methods of less than a generation ago. But that the system actually did produce the desired effect is amply proved by the fact that it was tolerated so long, and that it even yet survives

in the tradition, incomprehensible as it may seem to independent persons, that the official language of school and lecture-room must be English, even though the subject be Welsh, and the pupils Welsh-speaking.

It is not intended, in this brief summary, to make an apology for a language that has been a literary instrument for a thousand years, or a defence of the educational value of the home language. It is simply designed to give an idea of what has recently been done with the view of dealing intelligently with the language question in the schools of Wales; and an attempt is made to tell the story without what, to the casual reader, would only be meaningless detail.

After the union of England and Wales, even repressive English laws failed for a long time effectively to injure the language or to destroy native culture. The really dark days came when the Welsh aristocracy became Anglicised and ceased to extend their patronage to native literature. The little encouragement that had formerly kept native culture alive was no longer forthcoming, and literature as a profession became impossible. The literary tradition, however, persisted among the people, and, directed by the false philology of the eighteenth century, naturally developed into what has been rather inaccurately called "democratic literature." Democratic it is only in the sense that it was produced by poor people, mostly of the labouring class; but its standards were not those of the democratic speech; they were rather those of a so-called culture based upon utterly erroneous ideas and methods, and the earlier manuscript literature was practically unknown. Thus, when popular education began to develop in Wales, the native language and literature were not only ignored, but subjected to persecution. The schools were meant to destroy Welsh rather more than to teach English. At a school founded at Llandovery, by an intelligent

Welshman, with the stipulated " primary intent and object " of giving " instruction and education in the Welsh language," Welsh was abandoned, and we have it on the authority of one well-known writer that " more Welsh boys were taught to forget than to learn their native language within its walls." Even at the Theological Colleges, designed for the training of men who were to preach the Gospel in Welsh, mostly to monoglot Welshmen, the language was entirely ignored, and the lectures were in English. Even supposing the teaching of English to be the sole aim of education, no attempt whatever was made for many years to utilise the language known to the pupils for the purpose of acquiring the foreign language.

Slowly, however, it dawned upon some people that this system was stupid and senseless. The Cymmrodorion Society interested itself in the matter, and a " Society for the Utilization of the Welsh Language " was founded. This was really only comparable to the first step of a sorry slave, who had just discovered that he might use his own language merely to acquire another, and then, presumably, drop it. It was, however, a small step that ultimately led to another. Sir William Hart Dyke granted all that the Utilization Society demanded—or rather, begged for. Fortunately, by that time, Welshmen educated at the English Universities and on the Continent, had begun to take active part in Welsh affairs, and the value of Welsh literature had been partly discovered. Claims were advanced for the teaching of Welsh for its own sake and educational value. These claims were recognised by Mr. Acland in the nineties, but still the educational authorities, themselves trained in the days of the " Welsh Note ", and other methods, were slow to act as free men. Mr. Acland only allowed Welsh to be taught in Welsh schools, if the managers so desired. Generally, they

desired nothing of the kind, and even where they did, it was said that it would be unwise to "force the teachers." In view of these facts, the Utilization Society was re-organised, under the style of the Welsh Language Society, with the object of assisting in the training of teachers and generally in the promotion of the teaching of the language. Progress, however, was slow, practically until the passing of the Education Act of 1902 put the schools under the management of the County Councils. More liberally trained men had then a say in the matter; new schemes were devised, with due consideration of local linguistic conditions, and the result, in many of the Welsh counties, amounted to a revolution of methods. For this revolution, however, the way had been gradually prepared. From the Training Colleges and the Normal Departments of the National Colleges, numbers of qualified teachers had been turned out, and the summer schools of the Welsh Language Society had been, as they still continue to be, the means of assisting teachers to meet the requirements of the improved system. County Councils and Education Committees assisted by making grants to teachers desirous of attending the summer schools, and evening classes were also arranged in many centres during the winter months. To give a summary of all the schemes of the various counties would be more than the allotted space will permit, but it may be stated that throughout the schemes generally, the principle has been observed of giving a more or less thorough bilingual training in most of the schools. In the Welsh-speaking districts, instruction in the lower standards is given in Welsh and English is taught by the same method as would be adopted to teach any other second language. In English-speaking districts, the process is reversed. Results, particularly in the counties where the methods adopted have been most thorough, are already fully justifying the change.

There have been difficulties, of course, but experience tends to remove most of them. A frequent complaint is that of the lack of suitable books for use in the schools, but it is doubtful whether the dearth of books of the kind is really such as the utterances of some people would lead us to believe. I have before me the catalogues of four of the principal publishing firms of Wales. A glance through these lists shows that the output of suitable books is indeed very considerable. Mr. John E. Southall, of Newport, himself an Englishmen and an enthusiastic supporter for many years of the proper treatment of the home language of Wales, publishes a large mass of Welsh school literature. I find that he issues picture sheets, expressly arranged for language teaching, with handbooks on the same, based entirely on the direct method; picture books, giving the child opportunity for framing sentences of his own; alphabet sheets for infants; books for Nature study, suitable as readers in Standards I. and II.; Infants' Readers, with Welsh and English matter on opposite pages; monolingual Welsh readers for infants and for Standards I.–V.; books for the upper classes in primary schools, and for Welsh classes in Higher Grade, Secondary, and County Schools, Evening Continuation Schools and Technical Classes; books on the history, geography, literature and industries of Wales; bilingual readers and copy books; Welsh handbooks, grammars, selections for translation, recitations, historical charts, mottoes and proverbs, and more advanced works such as "Welsh Parsing," "The Latin Element in Welsh," and "Studies in Welsh Phonology."

Among the school books issued by the Welsh Publishing Company, of Carnarvon, are three bilingual historical readers, with illustrations and maps, forming a complete series; outlines of the History of Wales, suitable for primary and secondary schools; a History of Wales

up to 1137, in Welsh ; reprints of the Welsh classics ; books on botany and natural history ; recitation books, dictionaries, books of travel, and studies of child life and applied educational methods.

Messrs. Hughes & Son, of Wrexham, in their " Welsh Educational Series," supply a great variety of books, including nursery rhymes, toy books, wall sheets, bilingual readers, etc. In their " Gwalia Series " are included illustrated graduated readers, " Story Books of History," short stories suitable as readers, with complete vocabularies ; bilingual handbooks, guides to Welsh, exercises and grammars, children's story books, natural histories, historical works, stories from the " Mabinogion," school editions of the Welsh bards, collections of old Welsh traditions and tales, and school music, etc.

Among the school books issued by the Educational Publishing Company, of Cardiff, are pictorial class sheets for language teaching ; picture lessons in Welsh, illustrated Welsh alphabet, alphabet letters, letter pieces, types for word building ; Welsh nursery rhymes, monolingual Welsh readers, phonetic reading drill sheets ; advanced illustrated readers ; modern readers in continuous story-form, with extensive vocabularies ; Arthurian and other romances ; writing and composition books ; conversation exercises, studies in grammar and philology, students' dictionaries, primers of Welsh literature, recitation cards and books, Welsh songs and hymns, etc.

It may be added that all these publications are admirably printed and illustrated, and that in addition, these firms publish a large number of Welsh books suitable as school prizes. These somewhat bald summaries of publications have been given in the hope that they may be of use to teachers in Wales, as well as with the object of indicating to others, who may be interested

in bilingual teaching, what is being done to meet the demand for books created by the later developments of such teaching in the schools of Wales. In this respect, the opportunity of the Welsh schools is unique in this kingdom, for the experience of the foremost countries in Europe teaches that a thorough early training in two or more languages is of the utmost possible value in the race of life.

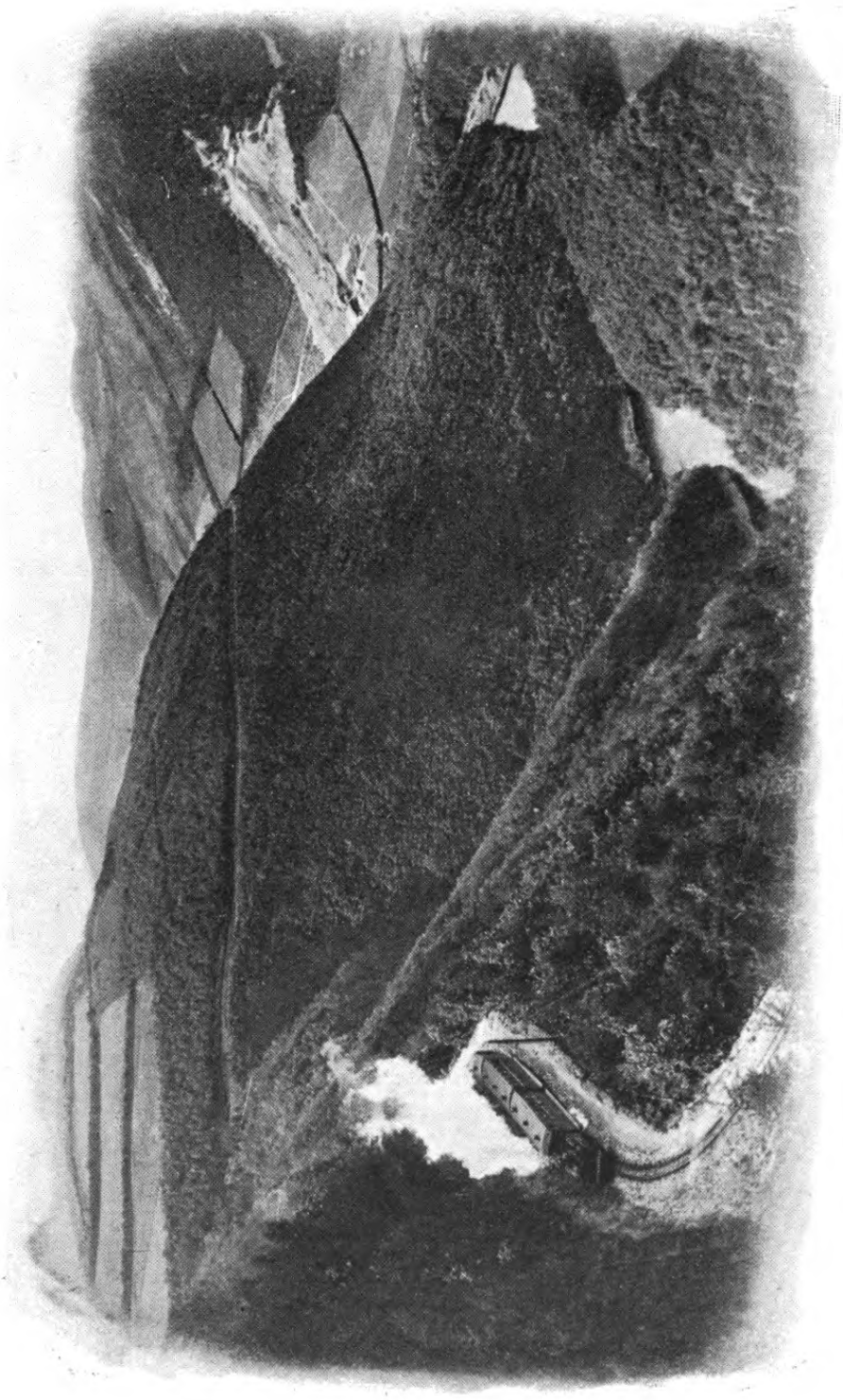
THE VALE OF RHEIDOL

THE Vale of Rheidol is beautiful at all seasons, and, since the opening of the railway to the Devil's Bridge, is visited each year by thousands of tourists.

In Spring, the greatest charm is the wonderful golden bloom of the gorse, usually at its best in the month of April. The first patch of gorse, and the largest in area, occurs soon after the train has crossed the river beyond Llanbadarn station. Beginning with a narrow strip, this tract of gorse widens out, and, seen from the train across the river, presents a mass of golden yellow of marked beauty. This group of gorse is on a level plain at the bottom of the valley, and is followed by a succession of smaller areas on the steep banks between the railway and the river, the finest of all being before and after passing the short cutting beyond Aberffrwd station.

At this point, for a brief period, in years when the blackthorn flowers freely, may be seen one of the loveliest effects of colour that nature affords. The white bloom of the thorn, the yellow of the gorse, blending with the fresh green of the trees to form a veritable rhapsody in colour.

If the short season of the blackthorn's blooming is over, there is ample compensation in the rich colouring of the foxglove, the red campion, and a profusion of other wild flowers, and, as spring draws into summer, there comes into prominence the beauty of the forests of trees which crowd the sides of the hills. The play of light and shade, the rich green of the mossy undergrowths contrasted with the shining bark of silver birches and copper beeches, added to the sense of shade and coolness created by the woodland paths wandering in and out both above



THE VALE OF RHEIDOL. [*Photo, W. R. Hall.*

and below the railway, fill the mind's eye with pictures, never to be forgotten.

And so with autumn and winter. We, who live within reach of this valley all the year round, know not which season is the most to be praised, for all have their charms.

Prior to the opening of the Vale of Rheidol Light Railway, in 1902, the valley was difficult of access. For the modest return fare of two shillings it is now possible, in an afternoon, to enjoy the beauties of one of the most picturesque valleys in the British Isles, and to visit the Devil's Bridge, while a whole day devoted to the excursion will bring some of the wildest mountain and glen scenery, and the far-famed Hafod within the possible programme.

The " Little Railway," as it is familiarly called, has its own station, less than five minutes' walk from the joint station of the Cambrian and Great Western Railways.

The other terminus of the line is at Devil's Bridge, a distance of 11¾ miles, and about 700 feet higher than the station at Aberystwyth. For the first five miles the railway runs along the valley of the Rheidol, passing the wayside stations of Llanbadarn and Glanyrafon, and a temporary halting place used when the territorial camps are pitched at Lovesgrove, just across the river. In five miles Capel Bangor is reached. The valleys now begin to narrow, and the train commences the series of ascents which in another seven miles will bring it out at the last station, a climb, roughly, of 100 feet for every mile from this point.

By the time the next station, Nantyronen, is reached, the railway is well up, terraced on the hill side, and the river far below. With each mile this distance between rail and river is increased, until it reaches its maximum somewhere in the neighbourhood of Rheidol Falls. The steep slopes to the river after passing Aberffrwd station

RHEIDOL FALLS. [*Photo, W. R. Hall*

are a little trying to the nerves of some people, but it will be conceded by everyone that the great beauty of the scenery fully compensates for the slight nervous tension.

It way be as well to state that not a single passenger has been injured, nor has there been an accident, save of the most trivial kind, since the railway was opened.

When passing near Rheidol Falls station a glimpse may be obtained of the Waterfall on the Rheidol. When the trees are in full foliage this is difficult unless the right moment is seized. The rough outline of a stag, formed by the bare rocks obtruding through the trees, on the precipitous hill on the other side of the valley, can be seen, however, for some distance, while a little beyond the stag, on the same range of hills, a cascade falls from the crest of the hill almost to the bottom of the valley. In dry seasons it looks scarce bigger than a white thread, but at other times it leaps in great style.

A short run brings the train opposite an unsightly lead mine, now worked only at intervals. Leaving Rhiw Fron station the gorges and tortuous windings of the river appear, and a hint of the great beauty of the wooded glens around the Devil's Bridge is obtained. The immediate vicinity of the station at Devil's Bridge is unattractive, and is apt to chill the visitor. People have been known to show their sense of this trifling anti-climax by returning to Aberystwyth by the next train. No greater mistake could be made. The station has happily been built in a position where it does not interfere with the beauty of the glens not two hundred yards away. A short walk down hill, and the famous Bridge is reached. In English, the Devil's Bridge; in Welsh, Pont ar Fynach.

THE BRIDGE

THERE is an excellent hotel at the Bridge, the "Hafod Arms," well appointed, well managed, and with moderate charges. In the season it is usually filled with guests. The great increase of motor-car tourists has brought a large influx of visitors to the hotel, it being a favourite halting place for motorists doing North and South Wales, and for those taking the run from Llandrindod to Aberystwyth and back, about 45 miles each way, through some of the wildest scenery of the Plynlimmon range.

The views from the hotel and from the spacious terrace are very fine. In front is the Cyfarllwyd Fall, on the River Rheidol, which, emerging from a deep gorge, swings round the elbow of a steep wooded hill, receiving the waters of its tributary, the Mynach, just at the point of the elbow. On the right, high above the Cyfarllwyd Fall, is a projecting rock—"Craig Adda," Adam's Rock—a fine view point, reached through a gate on the Llanidloes Road, near the Woodlands' bungalow.

From the terrace, the sounds of the Great Fall of the Mynach can be heard, in dry seasons soft and melodious, increasing, in times of flood, to a fearsome roar. Slight glimpses of the falls may be caught from the terrace when the foliage is off the trees. The steep tree-clad precipices, with the background of hills, make a striking picture.

A walk of a few yards and the bridge itself is reached, affording through the iron balustrades, a peep at the chasm through which the River Mynach races to join the Rheidol.

A turnstile on the right, just beyond the bridge (fee, 1s., which covers the whole round), admits to the only view of the old bridge and its successor, and also to the fearful chasm, so graphically described by George Borrow, whose impressions will be found in "Wild Wales." Since Borrow's day, a third bridge has been built above the other two. Bearing this point in mind his description cannot be equalled, so we quote it :—

"From the bottom of the first flight of steps leading down into the hollow you see a modern-looking bridge, bestriding a deep chasm or cleft to the south-east, near the top of the dingle of the Monks' River, over it lies the road to Pont Erwyd. That, however, is not the Devil's Bridge—but about 20 feet below that bridge, and completely overhung by it, don't you see a shadowy, spectral object, something like a bow, which likewise bestrides the chasm ? You do ! Well, that shadowy, spectral object is the celebrated Devil's Bridge, or, as the timorous peasants of the locality call it, the Pont y Gwr Drwg.

"To view it properly, and the wonders connected with it, you must pass over the bridge above it, and descend a precipitous dingle on the eastern side till you come to a small platform in a crag. Below you now is a frightful cavity, at the bottom of which the waters of the Monks' River, which comes tumbling from a glen to the east, whirl, boil, and hiss in a horrid pot or cauldron, called in the language of the country Twll yn y graig, or the hole in the rock, in a manner truly tremendous. On your right is a slit, probably caused by volcanic force, through which the waters, after whirling in the cauldron, eventually escape. The slit is wonderfully narrow considering its altitude, which is very great—considerably upwards of 100 feet. Nearly above you, crossing the slit, which is partially wrapt

in darkness, is the far-famed bridge, the Bridge of the Evil Man, a work which, though crumbling and darkly grey, does much honour to the hand which built it, whether it was the hand of Satan or of a monkish architect ; for the arch is chaste and beautiful, far superior in every respect, except in safety and utility, to the one above it, which from this place you have not the mortification of seeing.

" Gaze on these objects, namely, the horrid seething pot or cauldron, the gloomy volcanic slit, and the spectral, shadowy Devil's Bridge for about three minutes, allowing a minute to each, then scramble up the bank and repair to your inn, and have no more sightseeing that day, for you have seen enough. And if pleasant recollections do not haunt you through life of the noble falls and the beautiful wooded dingles to the west of the bridge of the Evil One, and awful and mysterious ones of the monks' boiling cauldron, the long, savage, shadowy cleft, and the grey, crumbling, spectral bridge, I say boldly that you must be a very unpoetical person indeed."

It is doubtful whether modern geologists would accept Borrow's theory of volcanic agency, and some of the awe which he describes is absent when the river is not in flood, as it was when he visited the scene. It must be remarked, too, that Borrow visited the falls west of the bridge first, a course which may still be followed by entering through a turnstile on the terrace, but the more satisfactory way is to take the view of the bridges and the Devil's Punch Bowl first, and then to cross the road to another turnstile, where a pleasant ramble through the woods by a descending path affords fine views of the main cascade and the great fall of the Mynach. From a rocky spur projecting into the valley, towards the junction of the two rivers, a good view of the fall on the Rheidol is obtained.

The details of the falls are thus described in the local guide.*

" From this point we may also observe several silver threads of water descending from the richly-clad steeps of the ravine. From the footpath along and down the ridge, the first or upper falls of the Mynach come full into view ; but the grand fall, which is the lowermost of the chain, is, in the summer, nearly hidden by the foliage. The first fall, which seems about 40 yards below the bridge, is about 20 feet in height, and the torrent, being confined to narrow limits, is thrown with great violence into a black pool beneath.

" Scarcely has the water been forced from this foaming receptacle, when it is projected from another precipice, of not less than 60 feet, into a smaller reservoir. From this it hurries into a third fall of 20 feet, when it encounters rocks of prodigious size, through which it struggles to the edge of the largest cataract, and pours itself in one unbroken volume down a precipice of 110 feet in perpendicular height. Descending yet further we come to the top of a steep flight of 100 steps—' Jacob's Ladder '—and some way down them pause at a point that commands the grand cataract, with a less perfect view of the three above it. At the bottom of the stony ladder the stream is crossed by a rustic iron bridge, from which a series of irregular steps lead up alongside the falls, and command very beautiful views of them individually.

" Near the basin of the third fall, and at the head of the fourth, is a dark cavern in the slaty rock, for years, according to tradition, the hiding-place of a notorious gang of free-booters known as Plant Matt, that is, Matt's children—two brothers and a sister—who were at last taken and tried, found guilty and executed for committing murder.

*Devil's Bridge Visitors Guide, Aberystwyth. Welsh Gazette Office.

THE FALLS OF THE MYNACH—DEVIL'S BRIDGE. [*Photo, W. R. Hall.*

"The total height of the various falls is 210 feet, while from the new bridge to the water beneath there is a depth of 120 feet, making a grand total descent of 320 feet. As, however, no allowance has been made for the inclined direction of the river between the various falls, the total height from the bridge to the level of the stream at its junction with the Rheidol is computed to be a fall of about 500 feet."

Like Borrow, the visitor is now a little tired, and a cup of tea at the hotel will be welcome, which offers the opportunity to gossip of the history and associations of this romantic spot.

First let it be stated that while some of the wealth of foliage is nature-sown, much of it is due to the judicious planting of the Duke of Newcastle, a former owner of the Hafod estate, of which the district forms part.

The well-known legend of the old woman who cheated the devil, is attached to this and to many other bridges. When and by whom the first bridge was built is unknown. Giraldus passed over a bridge here in 1188, when he travelled through Wales with Archbishop Baldwin. The second bridge was built in 1753, and the third was erected by the county council in 1900.

Literary men and artists without number have visited this spot, and described it with pen and pencil. Turner, greatest of English artists, drew the cataract during one of his early sketching tours in Wales, about the year 1793. Wordsworth visited the bridge in 1824, and wrote the well-known sonnet "To the torrent at Devil's Bridge." Keble, too, was inspired by the scene, the poem in the *Christian Year* for the twentieth Sunday after Trinity :—

"Where is thy favour'd haunt, eternal Voice"

being written on the occasion of his visit in 1822, while the poem for Easter Monday :—

"Go up and watch the new born rill."

was inspired by his excursion to the sources of the Severn and the Wye, on Plynlimmon.

In an earlier age Drayton recited in the *Polyolbion* the glories of the district, and John Phillips (Milton's nephew) celebrates Plynlimmon in his poem "Cyder," and again in "Cerealia," though the ascription of the latter poem to Phillips is uncertain. Shenstone, too, has written on the same theme, and Yalden wrote a poem on Sir H. Mackworth and the Lead Mines.

In the pre-railway days, when travelling by post-chaise was the only method of reaching this remote place, a large proportion of those who came here were moved to describe the scene, and many a printed tour, and tourists diaries as yet unprinted, record its beauties, interspersed with wailings at the badness of the roads, and the wretchedness of the inns.

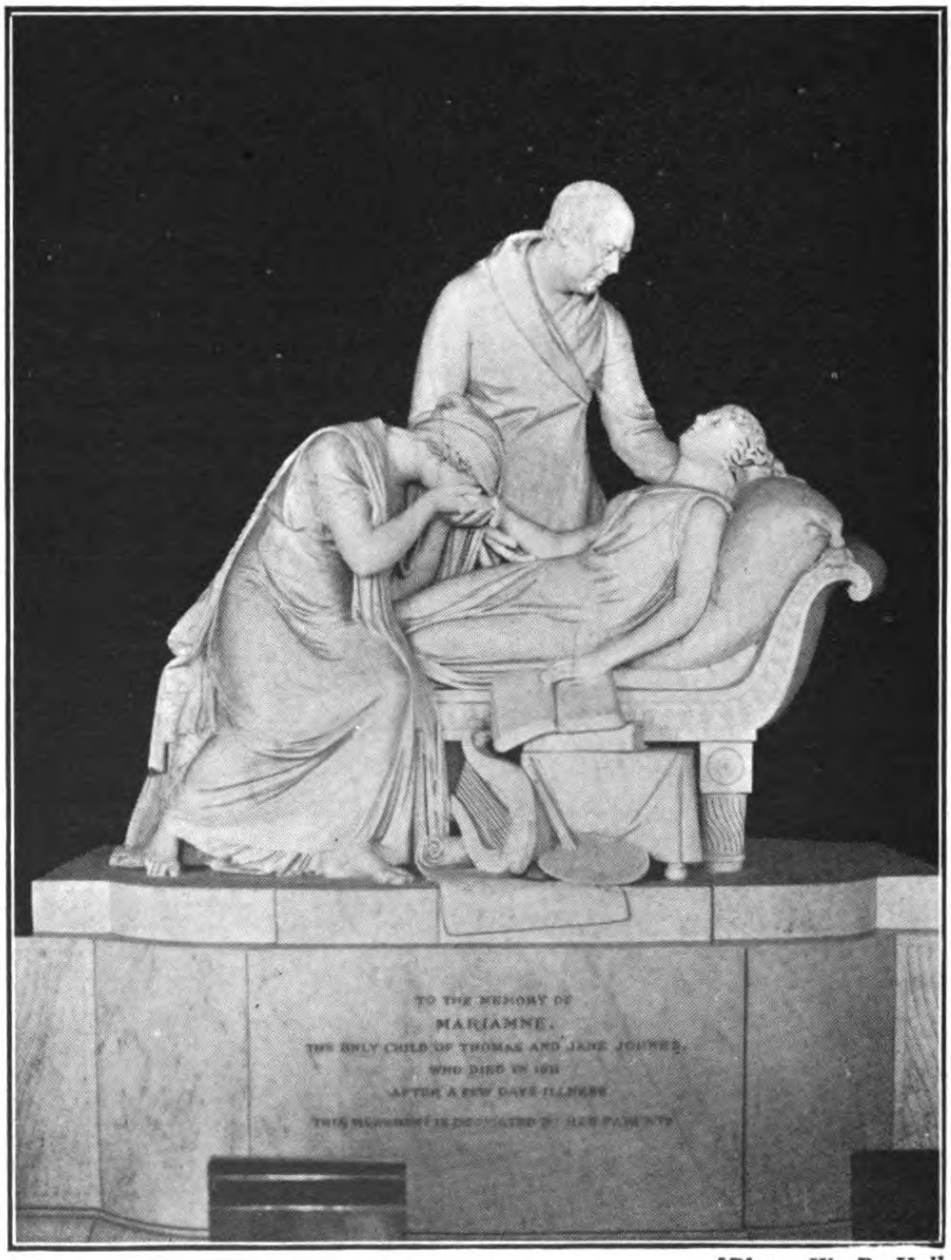
Happily, the causes of grumbling have disappeared, while the beauty remains.

The district abounds in places worth visiting, especially for those who can tramp a few miles over hills, or clamber up and down the steep sides of the valleys. To the Parson's Bridge and the quaint old church at Yspytty Cynfyn is a favourite excursion, and may be reached in a couple of miles along the Llanidloes road. Conveyances run in conjunction with the trains to Yspytty Cynfyn Church.

For those who desire to breathe the exhilarating air of the mountains there is plenty of choice. The mountain track above the golf links (behind the hotel) is well worth seeking, and offers views which repay the trouble involved. The road which branches off by the hotel, without crossing the bridge, leads in less than 2 miles to "The Arch," a memorial of the jubilee of George III., erected by Colonel Johnes of Hafod. The mountain track already referred to joins the road at the arch, and may be easily taken from there on the

return journey, descending by a fairly obvious path to the hotel or the railway station.

From the Arch it is a little over a mile to Eglwys



[*Photo, W. R. Hall.*

MONUMENT BY SIR F. CHANTRY, R.A., EGLWYS NEWYDD.

Newydd and Hafod. In the church is the famous marble monument by Sir Francis Chantry, R.A., erected

by Colonel Johnes to the memory of his only child. The figures of father, mother and daughter are faithful portraits, and altogether it is a great work of art.

A plain slab on the wall near the Chantry monument, has the following quaint inscription :

HERE LYETH $\frac{E}{Y}$ BODY—OF WILLIAM HERBERT OF HAUOD YCHTRYD—ESQVIER WHO HAVEING MARRIED HIS ONLY DA—UGHTER TO THOMAS JOHNES OF LLANVAIR—CLYDOGE ESQUIER DEPARTED THIS LIFE—THE 13TH DAY OF JUNE ANNO DOMINI 1704—AGED 47 YEARS.

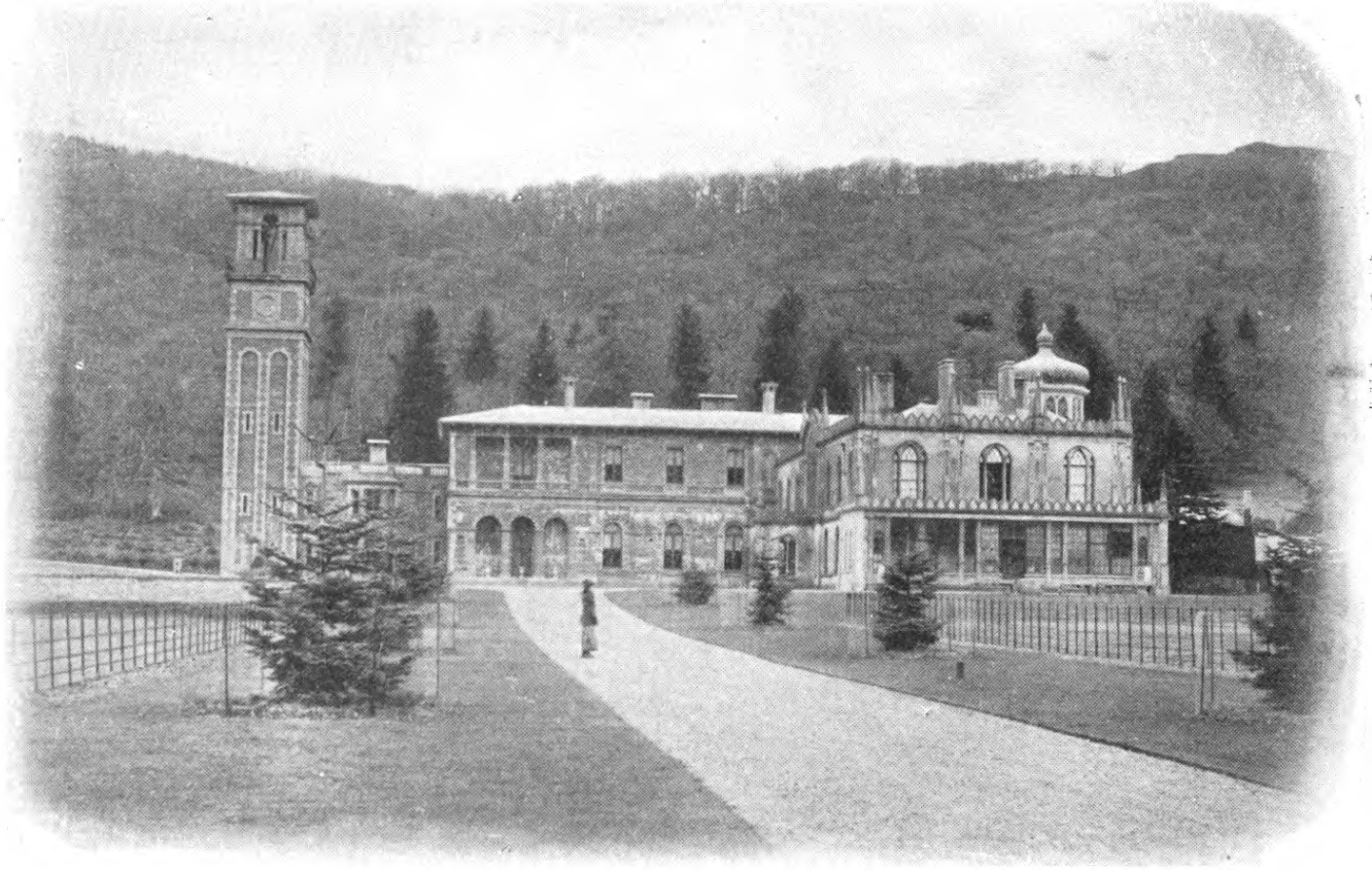
HAFOD

HAFOD HOUSE and Park, now the residence of T. J. Waddingham, Esq., come as a great surprise after the wild mountain scenery in the neighbourhood. The house is not shown to visitors, who are only allowed to pass along the lower road near the house. The Park itself, however, offers more than sufficient to fill up the time available. To attempt an account of its points of interest would be futile. Its beauties must be seen, and once seen the feebleness of any attempt to describe them will be obvious.

It is necessary at the outset to remember that the park of Hafod was created by the genius of one man, who, realising the possibilities of this valley of the Ystwyth, and the slopes of the hills on either side, set himself the task of improving and beautifying it. He spent a large fortune on the work.

Thomas Johnes the younger, was the son of the Thomas Johnes of Llanvair Clydoge, mentioned in the quaint inscription in the church of Eglwys Newydd. Educated at Shrewsbury, Eton and Oxford, he did the usual grand tour on the continent, and became well known to many of the leading men of his time, including George III., Henry Fox (Lord Holland), Sir Charles Hanbury Williams, Chantry and Bankes, the famous sculptors, and many others.

When he succeeded to the Hafod estates, they were satirically described as "the devil's grandmother's jointure." A few years later, Benjamin Heath Malkin, author of the best book on South Wales yet written, said: "Hafod and the Devil's Bridge will not shrink from a comparison with the finest scenery in North Wales."



HAFOD. [*Photo, W. R. Hall.*

Johnes conceived the idea of making Hafod the chief seat of his family, and set about the erection of a mansion in the Gothic style, in place of the old Elizabethan mansion of the Herberts. He found the roads impassable, agriculture in a very backward condition, and the people housed in miserable huts. He built comfortable dwellings, employed the people on his estate in planting millions of trees, and brought farmers from Scotland to improve the agriculture.

The mansion was filled with paintings and sculptures, and a noble collection of books and manuscripts. He gathered round him from time to time many of the great artists and writers. His labours as an Agricultural improver, and a man of taste commanded wide admiration. He was elected to represent first Cardigan and then Radnor in Parliament, was made a fellow of the Royal Society, and received many other recognitions of his talents.

In literature he will always have an honoured place as the translator of the Chronicles of Froissart, Monstrelet, and other works. To print these he set up a press at Pwll Peiran, near the Water Wheel, removing it later to Pendre. The editions of his works printed at this press are fine examples of typography, and are much prized by book-collectors. They comprise works in quarto and octavo, the quartos being the rarer.

After a glorious career of about a quarter of a century, Johnes was overtaken by a series of disasters. The mansion of Hafod was destroyed by fire on March 13th, 1807. The loss has been stated to be £70,000, of which £30,000 was covered by insurance. He rebuilt the mansion, but found himself in financial difficulties, and was compelled to reduce his expenses. Four years after the destruction of his house and its treasures, a still more grievous affliction overtook him, by the death of his only child, Miriamne, the subject of the monument

THE MINER'S BRIDGE, VALE OF YSTWYTH. [*Photo, W. R. Hall.*

in the church, who died in 1811. The loss of his accomplished child, added to his other misfortunes and troubles, seem to have broken down his health. In 1814 he had a serious illness, and went to Devonshire, where he died on April 23rd, 1816, in his sixty-eighth year. The estate was in chancery for many years after the death of Johnes, and in 1833 was bought by the Duke of Newcastle, and it has had two other proprietors, before it was purchased by its present distinguished and generous owner.

The house still contains a portion of the famous Pesaro library, which was on its way to Hafod when the fire occurred, but most of the works of art collected by Johnes have been removed by intervening owners of the estate. It is impossible to refer in detail to the features of the park, but, if possible, the Pwll Peiran waterfall should be seen, while the walk through Miss Johnes's garden introduces many pretty peeps, and will enable the visitor to see the Memorial pillar to the Duke of Bedford, erected by Johnes as a token of admiration of the Duke's achievements as an agricultural improver. In Miss Johnes's garden is a sculptured urn by Bankes, with an epitaph on a Robin Redbreast by Samuel Rogers.

The return journey may be made in a variety of ways. For the pedestrian with ample time and a friendly guide or a good map, the way by Pontrhydygroes (The bridge of the ford of the cross) and along the hills by Llantrissant, offers many attractions, and some pretty scenery. There are numerous other ways over the hills, each with attractions, but not to be undertaken without guidance. One of the two main roads should be selected by strangers.

GREAT WESTERN RAILWAY

DURING the last few years, the Great Western Railway has done a vast amount towards gaining for Aberystwyth the great popularity which it has undoubtedly achieved. Connected as it now is, by frequent direct trains with densely populated commercial centres such as Swansea, Cardiff, Newport and Bristol to the south; Liverpool, Chester, Manchester, Shrewsbury, etc. to the north, and also brought nearer to London by the opening of the new short Birmingham line through Bicester — Aberystwyth is most fortunately placed in the matter of accessibility.

The Road Motor Car Services instituted by the Great Western Railway have greatly enhanced the attractions of Aberystwyth from the holiday maker's point of view, by bringing many charming inland and coast village-resorts—the names of some of them practically unknown outside the boundaries of the "Sweet Shire"—within the usual touring round. Aberayron, Llanrhystyd, New Quay, Llandyssil, Lampeter, Strata Florida, etc., etc. may now all be conveniently visited with Aberystwyth as a centre, and it will be found that cheap inclusive tickets can be obtained at the G.W.R. Station for combined trips by rail and automobile which are equal for scenic beauty and historic interest with any to be found in the Principality.

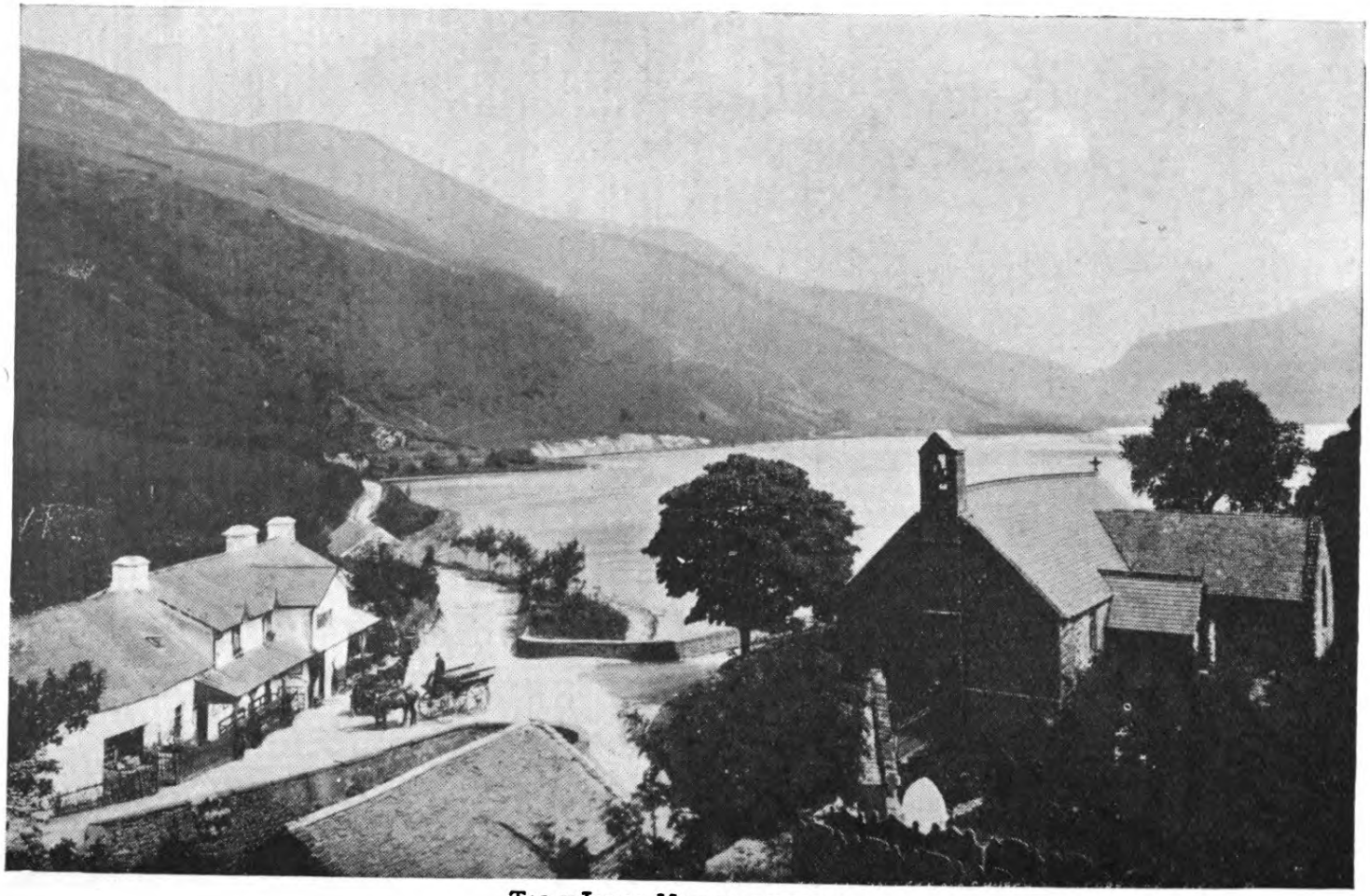
The Great Western Company issue at the nominal price of 3d., a beautiful travel book bearing the title "South Wales: The Country of Castles," which contains much interesting information about Aberystwyth and the adjoining country—"The Garden of Wales." This splendid volume is worthy of a place in the library after serving its purpose as a guide book, and should be in the possession of all visitors to the Conference.

UPPER END OF THE LAKE, TAL-Y-LLYN, MERIONETHSHIRE.

CORRIS RAILWAY

THIS narrow-gauge or " Toy " line runs through one of the most delightful little valleys in Wales ; mountain and river and wood blending together most harmoniously, and presenting a succession of charming scenery throughout the whole of the journey. Cheap Return Tickets are issued daily from May to October at all the principal Cambrian Stations to Corris and Aberllefeni, as well as for the Rail and Coach trip to Tal-y-llyn Lake, rendering the district easily accessible, and no one should miss seeing it. It is reached by taking the Cambrian train to Machynlleth, where alight and go down the steps to the Corris Railway Station and get into the " Toy " train of miniature saloons ; although so small it is surprisingly comfortable and travels smoothly. The whistle of the Lilliputian Engine is sounded and away we go, soon crossing the River Dovey and then passing between two hedges which almost seem to brush our faces, and we are at Ffridd Gate, the Station for Llanwrin, and Esgairgeiliog. Passing Llwyngwern we get a peep of the slate quarries which abound in the neighbourhood, and shortly arrive at Corris, where a coach is waiting to take passengers to Tal-y-llyn, which lies at the foot of Cader Idris. The lions of the Corris district are undoubtedly Tal-y-llyn Lake and Cader Idris Mountain, and during the year conveyances ply between Corris and Tal-y-llyn, which will enable anyone to leave Aberystwyth in the morning, get to the foot of Cader Idris without having done any walking, and return home in time for dinner.

The Guide Books are unanimous in saying that the best ascent of Cader Idris is to be found on this side, from the point where passengers are set down by the



TAL-Y-LLYN, MERIONETHSHIRE.

conveyances plying between Corris and Tal-y-llyn. This ascent is made by following the zig-zag path leading up to the gorge, at the end of which is Llyn-y-cae, then taking the path to the left and winding up to the cairn. Or the ascent can be made by striking off to the right at the top of the zig-zag path until a wall fence is reached, which may be followed right up to the cairn on the summit.

Tal-y-llyn Church, dedicated to St. Mary, close to the south-west end of the lake, is early British and probably dates from the sixth or seventh century. The font cannot be later than the ninth but many believe it to belong to the second or third century. Over the chancel there is a mediæval painting on wood panels representing the Twelve Apostles, which had been plastered over and was brought to light when the church was being renovated a few years ago.

From this point visitors may return either by way of Towyn, or Machynlleth, but the route must be decided when taking tickets. There is a good inn at Tal-y-llyn where luncheon and tea may be had.

CAMBRIAN RAILWAYS

GLORIOUS CAMBRIA,—particularly that portion lying on the shores of Cardigan Bay between Aberystwyth and Pwllheli—is excellently served by the Cambrian Railway Company. Forming junctions with several trunk lines at various points, the Cambrian Railway is able to draw visitors from all parts of Great Britain to the numerous beautiful resorts on Cardigan Bay.

Tourists travelling from Lancashire, Yorkshire, Cheshire and the North, travel *via* Crewe, joining the Cambrian line at Whitchurch, passing through Ellesmere (at which point the line from Wrexham and the Great Central Company connects), Oswestry, and thence to Welshpool. At this point connection is made with the L. & N.W. and G.W. lines from Shrewsbury, Stafford, Wolverhampton, Birmingham, London, and all places in the Midlands and South. Passengers from South Wales to the Cambrian Coast travel *via* Tal-y-llyn and join the Cambrian Railways main line at Moat Lane Junction, about 20 miles from Welshpool.

ABERYSTWYTH.—"The Queen of Welsh Watering Places," is the chief seaside resort on the Cambrian system, but a description has already been given of its charms and a brief notice of some of the other resorts along Cardigan Bay may prove of service. We would recommend our readers to glance at the particulars of the excellent facilities afforded to tourists in this district which are given at the conclusion of this note.

Travelling north by west from Aberystwyth along the Cambrian Railway, we meet with a succession of charming holiday resorts.

Eight miles from Aberystwyth is "Breezy Borth,"

an ideal place for families, where safe bathing and excellent Golf Links secure the appreciation of the adults, and the miles of glorious sands, with a gradual slope, enabling safe bathing, make it a delightful place for children.

A most popular excursion from Aberystwyth is to the Llyfnant Valley. By taking train to Glandyfi, and then by coach or on foot through the Llyfnant Valley, a most enjoyable day's outing may be had. The walk follows the stream until the Cascade is reached, in three miles from the station. Refreshments can be obtained near the Cascade, and the return journey may be made by walking to Machynlleth, three miles, or returning by the same route, which offers an entirely new view as the valley widens out towards the estuary of the Dovey.

As an alternative to the Llyfnant Valley, the Artists' Valley, also reached from Glandyfi station, offers the attractions of a wooded glen, cascades, and pretty views. The walking distance is about the same.

After leaving Glandyfi, Dovey Junction is reached, where a change of train is made, and the route lies along the coast section of the Cambrian Railways, the first station being Aberdovey, famous for its bells, which, however, only exist in song. Delightfully situated on one of the most beautiful rivers in the Kingdom, Aberdovey is a picturesque and peaceful health resort, enjoying a Southern aspect, well sheltered from the north winds; and owing to the mildness of the air, may be said, even in winter, to rival Torquay. The Golf Links are acknowledged to be amongst the best courses in the country, and the sands are firm and form a glorious promenade of three to four miles. Many interesting walks are found in the neighbourhood and capital boating can be obtained along the estuary.

The next station is Towyn, literally "the Sandy

WATERFALL IN THE ARTISTS' VALLEY.

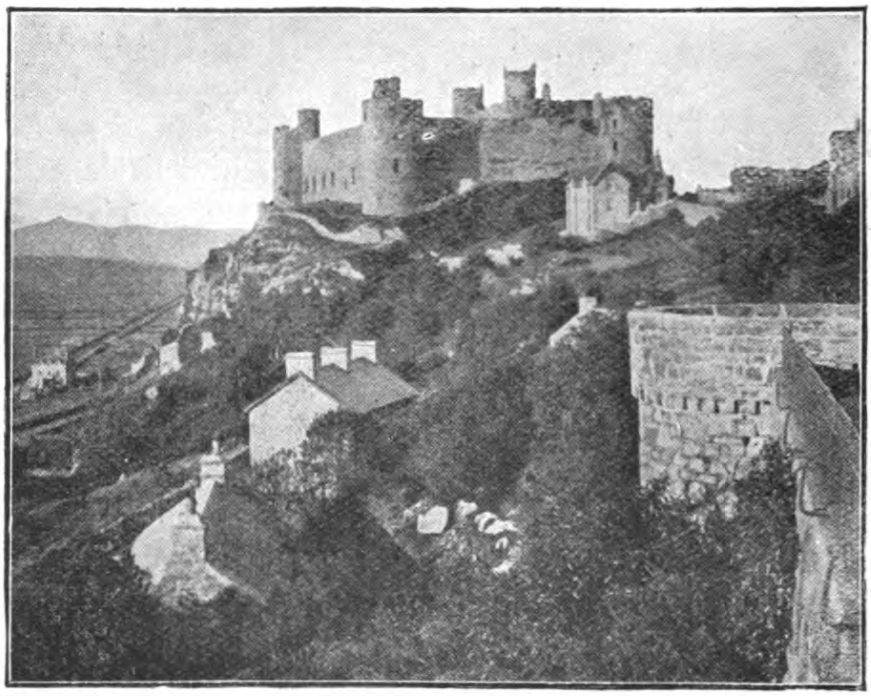
Shore," with a magnificent beach, which is a continuation of the unbroken stretch of Aberdovey, and runs northward towards Llwyngwril. It is a good centre for walking and coaching, and the best ascent of Cader Idris can be made from the Towyn side of the mountain. One of the most charming coach trips on the Coast is that from Towyn Station to Tal-y-llyn Lake and the foot of Cader, and thence on to Corris, joining there the miniature railway and returning *via* Machynlleth. The trip can also be made from Machynlleth and back to Towyn. Special day tickets covering rail and coach journeys are issued.

A few miles north of Towyn are the quiet little resorts of Tonfanau, Llwyngwril and Fairbourne. The last mentioned possesses a good sporting 9-hole golf course, which is much used by visitors to Barmouth. The bathing here is very safe, the sands extending for about two miles.

From Barmouth Junction to Dolgelley (36 miles from Aberystwyth, return day return ticket, 3s.) offers one of the finest trips in the district. The Torrent Walk, and the Precipice Walk at Dolgelley are well known to lovers of beautiful scenery, and the railway journey from Barmouth Junction to Dolgelley and back are also famous for the lovely glimpses of the estuary.

Crossing the Mawddach Estuary over the viaduct, which, in addition to carrying the railway line, has been converted into an excellent promenade, Barmouth is reached. From the centre of the viaduct looking up the estuary one of the finest views in Europe is obtained. One writer says that even the Lake of Lucerne cannot surpass it. All the attractions of a modern seaside resort will be found here: boating, bathing, fishing, coaching and mountaineering; golfing being obtainable at Fairbourne and Dyffryn, but the chief attraction of Barmouth is the abundance of walks in the immediate

neighbourhood. First and foremost is the Panorama Walk. The charm of the picture is the remarkable suddenness of the change. After a climb of three-quarters of a mile, almost instantly the incomparable view of the Mawddach Estuary opens out with a countless array of hills of all shapes and sizes showing their heads in every direction, and having their apex in Cader Idris.



HARLECH CASTLE.

At the mention of the name "Harlech" we are reminded of that well-known inspiring melody "March of the Men of Harlech." Just before the train enters the station it runs along the foot of the hill on which stands the beautiful old ruin of Harlech Castle. Long ago the town was often besieged by warriors, but the peaceful invasion of golfers is now the fashion, for the links of the Royal St. David's Golf Club are amongst the best in the United Kingdom.

PORTMADOC—the centre of the slate trade of North Wales—is also a capital district for walking and coaching tours. Daily during the summer season conveyances leave the station for the far-famed pass of Aberglaslyn "The Switzerland of Wales," Beddgelert and Snowdon. Borth-y-gest, a quiet little seaside resort, lies about a mile from Portmadoc. Here will be found a charming place for families, safe boating and bathing, good fishing and golfing, and it is within easy reach of the other places of interest on the shores of Cardigan Bay.

A strikingly picturesque situation, commanding sea coast and mountain views unequalled in extent and grandeur, in the midst of the most beautiful and romantic scenery of North-west Wales, combine to give Criccieth unrivalled advantages as a holiday centre and health resort. An excellent golf course, capital bathing and boating, coaching and mountaineering are amongst the attractions of this resort.

PWLLHELI, the northern terminus of the Cambrian Railways, is a most flourishing resort. The glorious bay and miles of golden sand make it at once an ideal place for families. The sea never ebbs but a few yards, so that the sea bath is ever inviting. An excellent centre for walks and drives, and also for excursions over the Lleyn Peninsula, Snowdon, Pass of Aberglaslyn, Beddgelert, Criccieth, etc.

The Cambrian Railways Company offer innumerable travelling facilities to the tourist to Aberystwyth. Throughout the year cheap day return tickets are issued between all coast stations the fare averaging about ½d. per mile. A fast tourist train leaves Aberystwyth each morning conveying excursionists to Borth, Aberdovey, Towyn and Barmouth. Holiday contract tickets are issued for the 70 miles of coast line between Aberystwyth, Machynlleth and Pwllheli from June 1st to September

30th, the charge for a seven days ticket being only 10s. 6d., and for a fourteen days' ticket, 17s. 6d. The holders of such tickets are enabled to travel between Coast Stations as often as they desire during the time for which the ticket is taken out. Combined rail and coach tickets are issued to Llyfnant Valley, Artists' Valley, Tal-y-llyn Leak and Cader Idris, Cwm Bychan Lake, Snowdon, Pass of Aberglaslyn, Beddgelert and many other places of interest.

Full particulars can be obtained at the Enquiry Office at Aberystwyth Station, and guides, time books, and all information will readily be sent by the Traffic Manager of the Cambrian Railways, Oswestry.

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INDEX TO ADVERTISERS.

	Page
Alexander & Shepheard	liii
Ayres' Correspondence College	ii
Bacon, G. W. & Co., Ltd.	iii
Bell, G. & Sons, Ltd.	iv
Blackie & Son, Ltd.	v
Boosey & Co.	vi
Brown, A. & Sons, Ltd.	vi
Cambrian Railways Co.	vii
Cambridge University Press	viii
Chambers, W. & R., Ltd.	ix
Clark's College	x
Clough's Correspondence College	xii, xiii
College of Preceptors	xi
Crempoid	xi
Cresswell, Ball & Co.	xi
Dusmo Co., Ltd.	xiv
Educational Handwork Association	xv
Foyle	xxiii
Frankland, C.	xviii
Frowde, H., and Hodder & Stoughton	xvi, xvii
Great Western Railway	xix
Hanfstaengl, F.	xix
Harbutt, W.	xx
Johnston, W. & A. K.	xxi
Journal of Education	xxi
Koh-i-noor Pencils	lvi
London & Northern College	xxii
London Teachers' Association	xxiii
Macdonald & Evans	xxv
Macmillan & Co., Ltd.	xxiv
Marshall, H. & Sons	xxvii
McDougall's Educational Co., Ltd.	xxvi
Meiklejohn & Holden	xxviii
National Union of Teachers, B. & O. Fund	xxix
National Union of Teachers, Examinations Board	xxx
Nelson, Thos. & Sons	xxxiii
Newmann & Co.	xxxii
Nisbet & Co., Ltd.	xxxiv, xxxv
Oxford University Press	xxxvi
Parlane, J. & R.	xxxvii
Philip, G. & Son, Ltd.	xxxviii
Rodney & Co., Ltd.	xxxix
Rudd & Co.	xl
Ryde, P.	xli
St. George's Magazine	xlii
Sampson, Low & Co.	xliii
Sanitas Coy.	xliv, xlv
Scholars' Own Magazine	xlviii
School Government Chronicle	xli
Schoolmaster, The	xlvi
Schoolmistress, The	xlvii
Singer Sewing Machine Co., Ltd.	p. iii, cover
Skerry's College	xlix
Stead's Publishing House	l
Taylor, C.	li
Teachers' Aid, The	xlvi
Teachers' Provident Society	xxxi
Towson & Mercer	li
University Correspondence College	p. ii cover
University Tutorial Press	facing p. ii cover
Unwin Bros.	lii
Ward, Lock & Co.	liv, lv
Waterman's Pens	lvi
Williams, J. & Co.	liii

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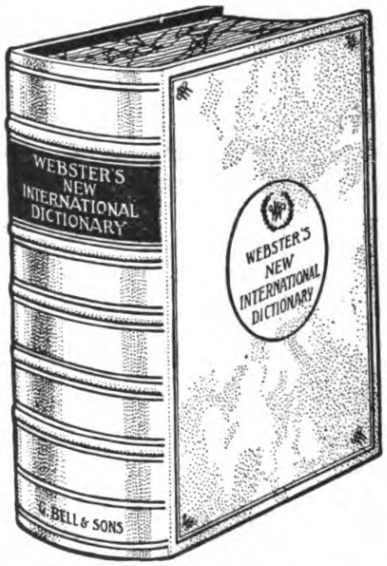

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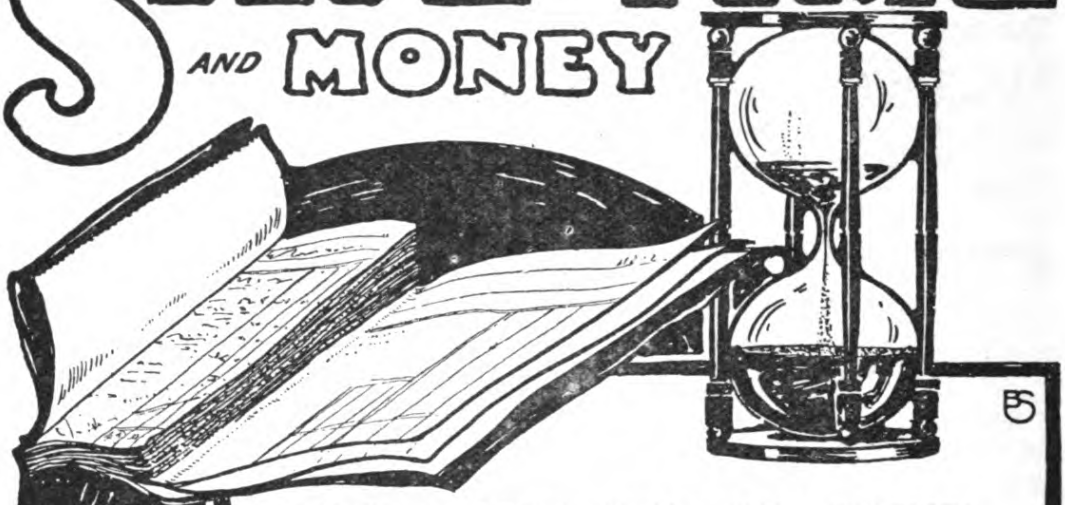

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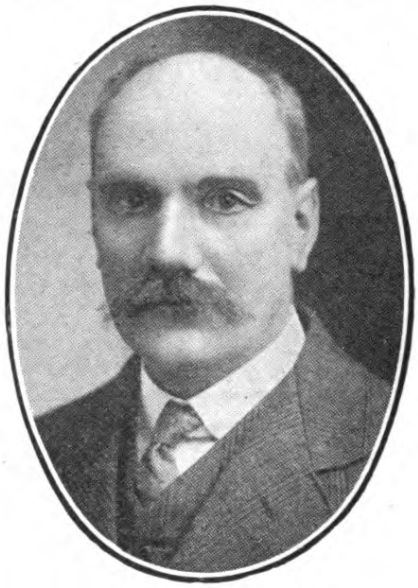

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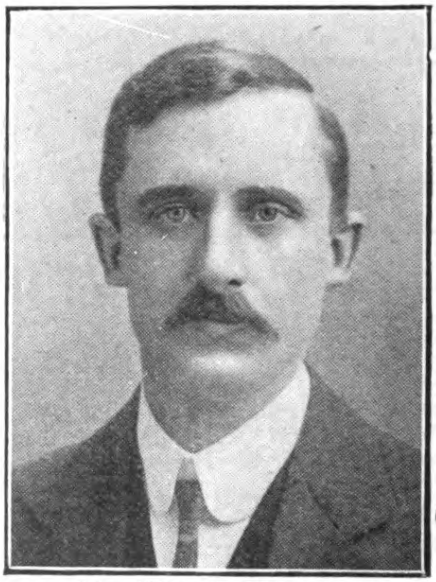

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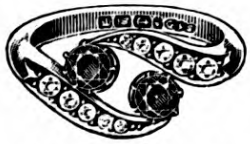

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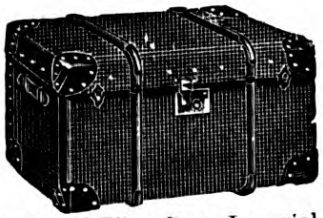

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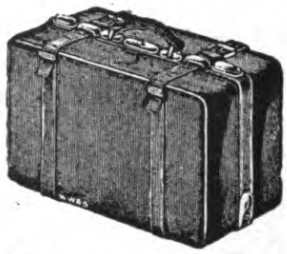

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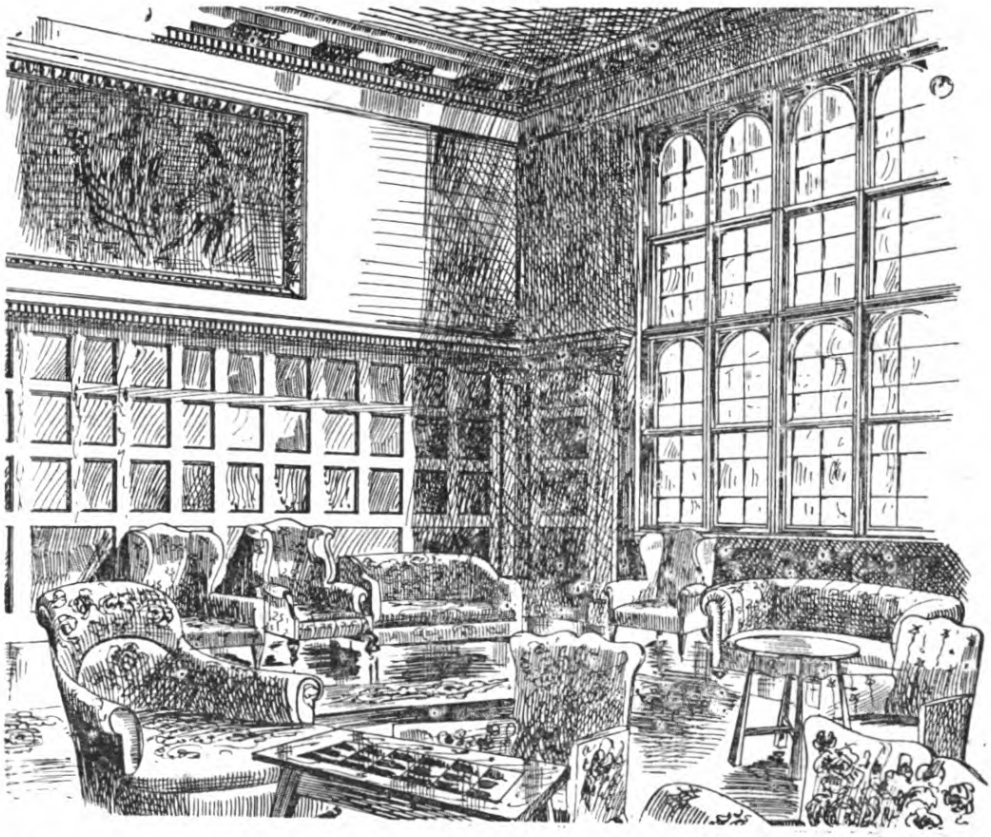

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The preparations that are in the main recommended for use are "Sanitas Okol" (or "Sanitas Bactox") and "Sanitas Fluid."

"Sanitas Okol" and "Sanitas Bactox"

Are the strongest commercial disinfectants yet discovered, being, according to the Rideal-Walker method of testing, at least twenty times as strong as pure Carbolic Acid. "Sanitas Okol" is prepared in the form of an emulsion ready for admixture with water in any proportions, and beyond its special application by way of a spray, is best suited for addition to all water that may be used for washing and cleansing purposes.

"Sanitas Fluid"

Is not such a powerful germicide, but it is quite strong enough to quickly destroy all disease germs, and it has the further most important qualification of imparting oxygen to the atmosphere of school rooms, thus vitalising the air in a way that no other disinfectant does. Being also non-poisonous and innocuous, it can be sprayed into the air and about the school rooms **while the pupils are present in classes,** without any kind of inconvenience or danger.

The "Close Smell"

So often noticeable in school rooms is largely due to the organic impurities present in the air as resulting from the breathing of the children and from the decomposition of the organic dirt on the children's bodies and clothes; hence, to thoroughly disinfect a school room, one must deal just as much with the invisible dirt of the atmosphere as with the visible and tangible dirt on the walls, floors, &c., and for this purpose the joint application of "Sanitas Okol" and "Sanitas Fluid," as above directed, provides an all-efficient remedy. They are both guaranteed to have a germicidal strength 20 times that of Carbolic Acid by the B. Typhosus Test, but whereas "Sanitas Okol" takes the form of a ready-made emulsion, "Sanitas Bactox" is a homogeneous, clear, dark-brown saponaceous Fluid, giving a milky emulsion when added to water. Where very hard or brackish water is all that is available, the former should be used. "Sanitas Okol" is also slightly cheaper than "Sanitas Bactox."

The "Lancet" Commissioners

Have shown by their particular test recently carried out that "Sanitas Bactox" ranks equally high with one other preparation as the highest in germicidal power of the homogeneous group, and takes first place alone with the cost as compared on the basis of efficiency. By the standardised B. Typhosus (Rideal-Walker) Test, however, it shows a co-efficient of 20, whereas the other disinfectant only shows 15. Again, "Sanitas Okol" takes first place in the group of emulsified coal tar preparations, both with respect to efficiency and cost.

Cleansing and Disinfection

After school hours each room should daily be thoroughly sprayed with a mixture of "Sanitas Okol" (or "Sanitas Bactox") and water in the proportions of one tablespoonful of the disinfectant to each gallon of water. The floors should also be well sprayed or sprinkled with the same mixture, and then the room should be swept up and the sweepings removed. The floors themselves, and all woodwork in the rooms, should be periodically cleaned by wet scouring with soap and soda, preferably rendered disinfectant in character by adding a tablespoonful of "Sanitas Okol" (or "Sanitas Bactox") to each bucket of water.

An alternative and very good method of cleansing and purifying desks, forms, tables, &c., consists in lightly rubbing them over once a day with "Sanitas Furniture Polish," using any soft cloth for this purpose. The use of this sanitary preparation gives an impervious face to the articles, so that the germs cannot get below the surface and lodge there.

During school hours the air of the school rooms should be sprayed in the middle of each morning and afternoon with ordinary "Sanitas Fluid" diluted with twice its own quantity of water; the re-vitalising of the air thus brought about is most striking, and will be found most grateful and beneficial to the scholars and teachers.

Lavatories and w.c.'s should be kept scrupulously clean and periodically sprayed with the mixture of "Sanitas Okol" and water as above recommended, and all earth closets should be provided with a tin of "Sanitas Powder" for use in same (renewable from bulk).

School Influenza

During epidemics of influenza, however mild or severe in character, the spread of the disease amongst the scholars and teachers may be effectually prevented by, and great benefit will be found to result from, the more frequent application of "Sanitas Fluid" and water by way of spray into the atmosphere of the class rooms, as previously directed.

School Slates

The common practice of cleaning slates with saliva obviously renders these articles likely vessels for the spread of infectious disease, and should be strictly forbidden and punishable. A wide-mouthed jug or basin should be provided, containing a mixture of 1 part "Sanitas Fluid" and 4 parts water, in which the pupils should be instructed to wet and rinse out their sponges once or more a day, as required for slate cleaning. The vessel should be emptied and refilled with a fresh mixture each morning.

For the disinfection of drinking cups, cloak rooms, playing sheds, lavatories, w.c.'s, &c., drains, sinks, school books, walls and ceilings, and in cases of infectious diseases, full details of a systematic scheme recommended by us will be found in our pamphlet upon the subject of school disinfection, and reasonable size samples will be supplied, free of charge, upon application to the "Sanitas" Company, Limited, Locksley Street, Limehouse, London, E.

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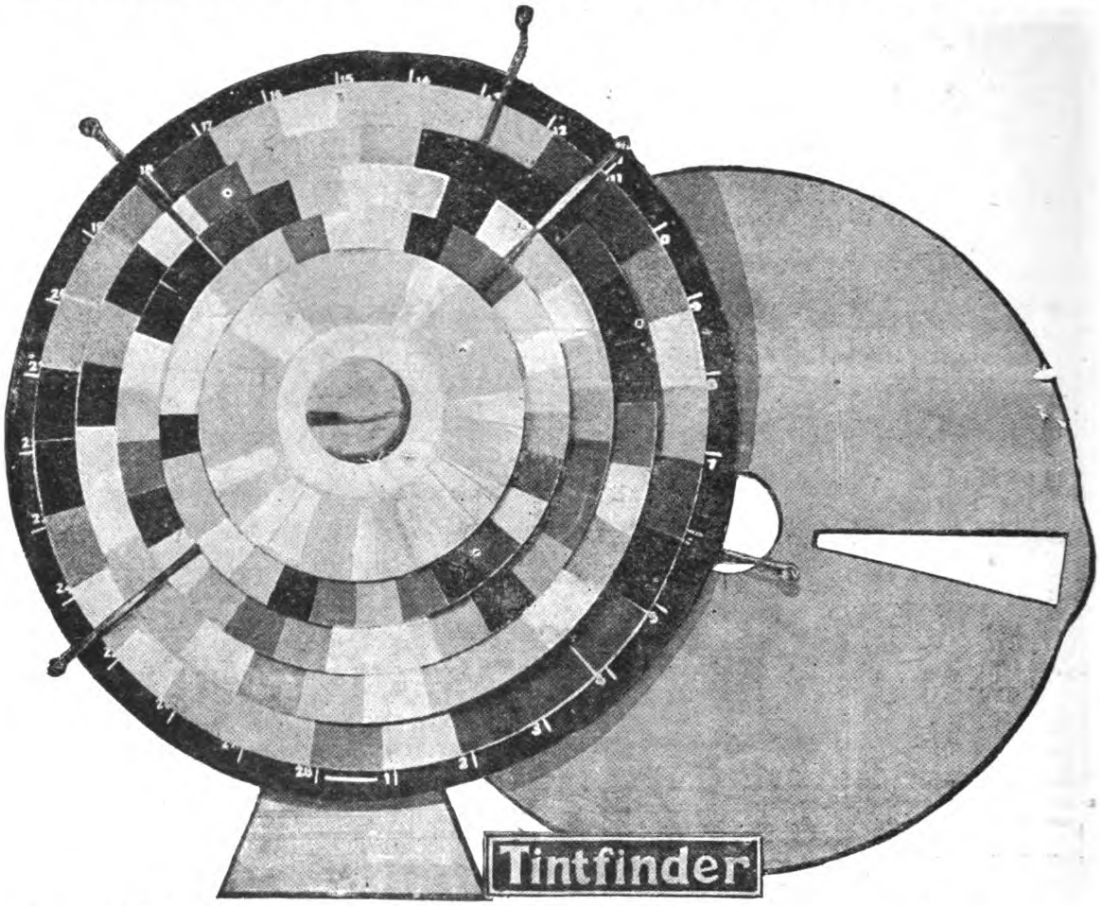

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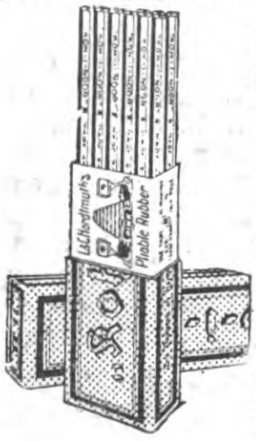

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