

**A PLEA FOR IRISH MINES AND MINERALS, UNDER AN
IRISH BOARD, AND FOR PREPARATION OF A
MINING SURVEY.**

BY HANBURY C. GEOGHEGAN, ESQ.

[Read Friday, February 7th, 1908.]

BY the Irish Land Act, 1903, it is enacted that on the sale Sec. 13, sub. sec. 3. under the Land Purchase Acts of any land *by the Commission*, or of any land comprised in an Estate, by the *owner* of the estate, there shall be reserved, in the prescribed manner, to the Commission the exclusive right of mining and taking minerals, and digging and searching for minerals on or under that land, and the said right shall be disposed of by the Commission in manner hereafter to be provided by Parliament. *Provided that* this sub-section shall not apply :

(a) To any demesne or other land re-sold in pursuance of section 3 of this Act.

(b) or to any such right which constitutes a superior interest, or which is vested in the Crown.

(c) Or to any stone, gravel, sand, or clay.

Provided also that where any such right reserved to the Land Commission is at any time hereafter let, leased, sold, or demised by them, the Vendor (or the person that would be entitled thereto, if the lands had not been sold) shall be entitled to receive 25 per cent. of any rent, purchase money, or other nett profit received by the Land Commission in respect of same, unless the Land Commission shall have purchased from the person entitled to such percentage his interest therein; and the Land Commission may purchase such interest at any time on such terms as may be sanctioned by the Treasury.

Where any right mentioned in this section is so reserved, Sub sec. 4. there shall be attached thereto a right to enter upon the land in respect of which the first mentioned right may be exercised, and to authorise any persons so to do; but any person entering upon land in pursuance of this sub-section shall be liable to make reasonable amends and satisfaction for any damage done or occasioned thereby.

Sec. 99. But nothing in the Act shall affect any mineral rights or water rights which are not in the possession or enjoyment of the Vendor at the time of sale. Or any mine or quarry which is being worked or developed by the Vendor at the time of sale. Or any right to water power in actual use by the Vendor at the time of sale.

Sec. 43. The Treasury may, on the request of the Land Commission, direct the advance out of the *reserve fund* established under sub-section 2 of section 5 of the Act of 1891 such sums as the Land Commission may certify to be required for the benefit or improvement by them of estates and untenanted land.

Sec. 98. "Estate" means any lands which the Estates Commissioners may declare fit to be regarded as a separate estate for the purposes of this Act.

7 Edw. VII.,
chap. 38. The reservation to the Commission of these rights apply to all such sales taking place after the 31st October, 1903, and on the 28th August, 1907, Parliament gave the Commission the following powers over these minerals :

(1) The Irish Land Commission *may let, lease, sell, or demise* to any person in such manner and subject to such conditions as they may think proper and at the *best rent or price as the case may be* which may be obtainable, any exclusive right of mining or taking minerals or digging or searching for minerals, reserved to them under Section 13 of the Irish Land Act, 1903.

(2) For the purpose of ascertaining the value of any such right, the Commission may either alone or in association with any other persons, after having given to the occupier of the land in respect of which the right is to be exercised, at least one month's notice by registered letter addressed to him at his last known place of abode ; and subject to the provisions of sub-section 4 of the said section 13 as to compensation, enter upon the land *and make such borings and other experiments as in the opinion of the Commission appear necessary or desirable.*

(3) Out of the profits arising from any dispositions of any such right made by the land Commission, there shall be paid any expenses incurred under the authority of this Act in relation to such right, and any sums advanced out of the reserve fund mentioned in section 43 of the said Act of 1903, for payment of those expenses shall be repaid to that fund ; and the nett profit remaining shall, after deduction of the per centage provided for in sub-section 3 of section 13 of the said Act, be paid into and form part of that fund.

(4) The powers conferred upon the Land Commission by this section shall only be exercised with the approval of the Judicial Commissioner, and after having, where practicable,

ascertained the views of the person entitled to the aforesaid percentage.

(5) Not less than one month before any disposition is made under this section of any right, the Commission shall publish in a newspaper circulating in the locality where the right is to be exercised, a notice stating their intention to make a lease or sale as the case may be, and inviting offers from any persons wishing to exercise the right.

These statutes give no definition of "minerals," "stone," "sand," or "clay." The primary meaning of "minerals" is all substances of the land other than its agricultural surface, but so much depends always upon the context, that thence innumerable questions will arise. Fishbourne v. Hamilton, 25 L. R., Ir., 483.

The previous statutes did not interfere with the minerals or mining rights of either Landlord or Tenant; but by the operation of these enactments a large portion of the *mineral wealth* of Ireland has been *nationalised*, and the Commissioners will 'ere long hold in their hands the minerals and mines, but not the quarries, of the greater part of Ireland.

How are the Commissioners to execute this Great National Trust?

The first step is to have a careful mining survey made, for hitherto none has been attempted; the geological survey, about which more hereafter, was made from surface indications only, and from such mining information or traditions as the officers could collect. For the preparation of a mining survey it is essential to make expensive boring operations, in such localities as may be advised by our mining experts, and for this diamond-drills and a large sum of money is necessary.

What provision does Parliament make for this expenditure, an expenditure which, in the opinion of our experts, would be a thousand-fold repaid by the mineral wealth disclosed? Parliament gives the Commission power to borrow from that hopelessly hypothecated and bankrupt fund, which our President so fitly named "the arrested development grant," (an arrest so fell that none go bail for its appearance), nor is any other provision therefor made!

In no other civilized country but this has the State made no attempt to ascertain what assets in the shape of minerals the country possesses.

Most civilized countries have formed a Mining Department for the purpose of collecting, preserving, arranging, and making available to the Public all information respecting the Earth's crust and substrata, and of the results of boring and other mining operations, and all plans of mining and under-ground excavations, for the guidance of those interested in mining: and the formation of such a Department in Ireland in substitution for the various English Departments that control our mining operations, is greatly to be desired.

if the Irish Press and Public recognised the importance of our mining interests, and of their neglect by the Imperial Parliament, public opinion would demand that the Irish Land Commission should forthwith be provided with ample funds for making systematic boring operations, and a complete mining survey of the whole island; but when I speak of the necessity of such boring operations and survey, I am met by the statement, often by those supposed to be well informed, that we have no metalliferous ores or other minerals worth speaking of in this country. That is, however, not the fact; it is contrary to the teaching of our ancient history; of comparatively modern times, and is also in sharpest conflict with the opinions of our best informed and most competent scientific experts, for the mines and minerals of Ireland are now, and have ever been, worthy of our diligent attention, and the present false opinion to the contrary is directly traceable to a negligence on the part of the State, which is in marked contrast to the diligence and fostering care of the pre-union Parliament of Ireland; but now we permit ourselves to be persuaded that we have no coal, metalliferous or other minerals, and in so doing give credence to those who are vendors of the very commodities in question, and whose past treatment of our National Industries, and recent attack upon Kynoch's Arklow Factory, has not justified such guileless confidence on our part.

For the writing of this paper I have but this equipment, I am a little less ignorant of mining than some lawyers, and a little less ignorant of law than most miners.

Our mines tempted the Phœnicians here, and traces of their mining operations are visible here as in Cornwall. After their time Irish mining was largely carried on, and throughout Ireland vestiges of ancient mining operations are visible, and sometimes on a scale to indicate that the ore must have been of great richness to justify such extensive and expensive excavations. Under 14 feet of peat, the shaft leading into an old mine was discovered many years ago in Munster, in which was found an old rude oak ladder, and the skeleton of the miner; how much else the peat hides who can tell?

In mining coal at the Ballycastle Colliery the miners in the year 1770, broke into workings consisting of thirty-six galleries, so old that no record or tradition remained, and the old mining tools on removal to the upper air crumbled into dust. The late Sir Richard Griffith thought these excavations represented the most ancient coal mining in the United Kingdom. The *History of Ireland* by the Four Masters, and other ancient records, show that the precious metals were native and abundant in Ireland.

Our Irish Parliament in those unscientific days, when the rocks were thought to be but little older than Moses, knew of, and believed in, the existence of our mineral wealth, and did much for the encouragement and development of mining industry. Our land owners were then resident, and knew much more of this country than our present Legislators, though then, as now, mining enterprise was much discouraged by impediments created by the Crown.

In Queen Elizabeth's reign a case aptly called *the case of mines*, for though the defendant was but one man, the Earl of Northumberland, the decision affected all mines in England, and decided that not only was all gold and silver, wherever situate within the realm, the property of the Crown, but all other metals, whether situate on Crown lands or on lands of the subject, were also the Crown property, if such ores contained any admixture of the precious metals, however small, and as most metals contain some such slight per-centage (fortunately they were not then aware that coal sometimes contains the precious bane) the decision was of far-reaching effect.

Bacon, in his address to James I. on the true greatness of Britain, points out that such rights in the lands of the subject were almost unknown in the case of any other European Sovereign. When Ireland came under English rule it became subject to this law; it was no longer lawful to mine for gold or silver, except upon conditions almost impossible; and only because of legal restrictions, and not from any failure of the metals, gold and silver mining ceased in Ireland.

Thenceforth also any man who succeeded in raising base ores to the surface incurred the risk of having his minerals ravished from him by the Crown.

By an Irish Act echoing an English statute, not now enforced, but still recited in leases of Royal Mines, the Crown gave some grudging and partial release of these Royal rights and permitted the subject to raise from his own lands, and retain, four metals, copper, tin, iron and lead, though containing gold and silver, but this was expressly made subject to the pre-emptive right carefully preserved of the Crown to take his copper at £16 a ton, lead at £9, and tin and iron respectively at 40s. the ton, or prices little less than confiscatory.

Under these discouraging circumstances the Irish Parliament, which in 1715 had decided on constructing throughout the island a complete canal system, thus acting on William of Orange's hint that to do so would make of Ireland a second Holland, in 1723 passed a Statute entitled "An Act for the further encouragement of finding and working mines and minerals in this Kingdom," by which power to make leases for 31 years of mines "whether already discovered or hereafter to be discovered," and of ample

Plowden 336.

4 Anne, cap. 12, 5 Wm. & M., cap. 6.

2 Geo. I., cap. 12.

10 Geo. I., cap. 5.

accommodation lands, was give to all corporations, collegiate, ecclesiastical and lay, and to most limited owners, whether restrained from committing waste or not, subject to certain conditions, one being that the Lessee should keep at least six able-bodied men employed in mining operations for 150 days in the year, or forfeit his lease. By subsequent Acts further to encourage mining, the minimum royalty which limited owners could reserve on coal leases was reduced to but 2d. a ton, thus enabling them to give greater inducement, and the leasing power was raised from 31 to 41 years. Nor was mining for iron neglected. Sir Charles Coote alone gave employment in his iron mines to no less than 2,500 men.

23 Geo. II.,
cap. 9.

25 Geo. II.
cap. 10.

In 1751 owners of coal and other mines were empowered to make roads connecting their mines with the nearest canal. Various Acts of Parliament were passed incorporating mining companies, and the Wicklow Mining Company was given powers to construct Arklow Harbour, and cut a canal to the lead mines at Glenmalure or "Glen of much Ore," and to the neighbouring copper mines. Money was also voted to develop the Arigna coal district, and £23,000 was voted for improving the harbour at Ballycastle, to assist in developing the Ballycastle Collieries; a canal was also cut at the public expense to connect the "Coal island" district with Lough Neagh.

Lecky tells us in his account of the insurrection of 1798, that after the Battle of Wexford, Father Bourke crossed the mountains to Castlecomer in hope of being joined by the resident mining population, and that Lord Castlecomer was said to net £10,000 a year from these collieries.

In 1800 we lost the power to apply public money to ascertain what mineral assets we possess; both power and responsibility passed to the united Parliament.

What have they since done to help our mining development? Nothing, except that for a scientific and not commercial purpose, they gave us a so-called Irish Geological Survey Office, and as many persons think such an office fulfils all the requirements of a Mining Department, and dispenses with all need for the preparation of a mining survey, I shall say a few words about the

Irish Geological Survey Office

Until a few years ago, when happily it was enfranchised and affiliated to the Irish Agricultural and Technical Department, the Irish Geological Survey was but a branch of the Geological Survey of the United Kingdom, in complete subjection to the head office, and its courteous officers (whose ability and scientific knowledge are undoubted), often for protracted periods were withdrawn from Ireland, and engaged on research elsewhere. Despite all impediments the Irish office have

prepared a Geological Survey of the twenty millions acres contained in this island, of which 2,830,000 are bog, and have collected in their memoirs a mass of valuable information respecting Irish minerals and mines; but have necessarily worked only upon superficial indications and such voluntary information as they could obtain from persons engaged in Irish mining operations. All requests from the Irish office for plant, and permission to bore, specially on the Western shore of Lough Neagh, were refused, though it was alleged the proved area of the Tyrone coal-field would thereby be probably trebled in extent. In so refusing the London office stated such boring operations should be left to private enterprise, but I have never heard that the many wealthy English Companies who own large estates in Ireland ever made use of a diamond drill, and it is certain that the State has been very culpably negligent; no attempt even has been made to ascertain the depth of our peat bogs; though Russia has ascertained the depth, and published carefully prepared maps, of her peat-deposits, and it is certain that there are many square miles of our bogs which hide payable coal, fire-clay, iron ore, and other minerals.

Vain attempts were made from time to time to induce the Executive to give some attention to our minerals.

A scientific witness of the highest authority, the late Sir Richard Griffith, F.R.S. of Edinburgh, Inspector General of His Majesty's Royal Mines in Ireland, writing in 1814 of our minerals, and their neglect, expresses himself in the following weighty words:

"The internal treasures of Ireland remain unexplored, although there is scarce a county in Ireland which does not exhibit indications of valuable mineral productions."

So wrote this eminently qualified and trustworthy witness when presenting his geological and mining report on the Leinster coal-fields to the Royal Dublin Society. "Our celebrated countryman," he continues, "the late Mr. Kirwan, laid a proposal before the Government for a Mining Board similar to those under whose guidance the German mines are conducted, but it was imagined that the control which this Board was intended to possess, over all the mines in the country, would interfere too much with the property of private individuals, and could not be carried into effect consistently with the freedom of the British Constitution. The Right Hon. Charles Greville, the enlightened patron of mineralogical science, was also very anxious on this subject, and a very short time before his lamented death, he addressed a letter to the Earl of Liverpool pointing out the benefit which Ireland would derive from a general examination of its mines and minerals."

When presenting his three subsequent reports on the Connaught, Ulster and Munster coal-fields to the same Society in subsequent years, Sir Richard Griffith returns to this subject, and, while deprecating the large sums under ignorant direction squandered in mining ventures, which through the aid lent by such a Board would have eventuated very differently, he again laments that for want of such a Mining Board no record is kept of the result of borings, sinkings, or other mining operations, and that even a few months after such explorations, no record or memory remains of them. I refer to these reports in the various Public Libraries. Sir Richard Griffith gives therein detailed measurements of the strata and seams of coal in the four provinces, and states that there is no real scarcity of coal in Ireland, that it is found in seventeen of our thirty-two counties, and he points out where workable and payable coal awaits the miner.

Sir Robert Kane, he being then Professor of Natural Philosophy to the same Society, a Society which has done, and attempted, so much good for this country, takes up the tale and tells us in 1845 that "the well-considered subject selected for his life-work and study," was the promotion and development of Irish industry, and of industrial knowledge in this country; and in that standard work of his, *The Industrial Resources of Ireland*, which contains so much that is valuable respecting our mineral wealth, he says:

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"In other countries it has been the most anxious care of Government, and of those entrusted with the superintendence of education, to ascertain the nature and amount of their means of promoting industry, and extending the employment of the people; thus it is that every year sees the Continental nations making such giant strides in manufacturing activity. It is thus that the physical disadvantages that so long had kept them back, are gradually being lessened in importance; if," he adds, "similar zeal and intelligence were manifested in developing the resources of this country, there would be no fear for the result."

These three authorities, Kirwan, Griffith and Kane, are still names to conjure with; but their suggestions sounded in an indifferent ear. We are still without a Mining Board, and a mining survey of Ireland has yet to be begun; this is also true of Britain, but it does not suffer therefrom as we do; for their wealthy owners holding great tracts of land are resident (the Ecclesiastical Commissioners alone draw £100,000 a year in coal-royalties), and have interests and resources enabling them to defray the costly expense of boring, and other operations necessary to develop their mineral wealth. But they are not satisfied with the position in England, and feel there the need of such a Mining Board as Kirwan and Griffith desired to see established here, for in

1905 the Royal Coal Commissioners report that "a great number of borings have been made at various depths in various parts of the country ranging to upwards of 3,000 feet in depth; at present no machinery exists for preserving any information thus obtained, and we think it would be of great advantage if particulars of borings could be collected and preserved in a Government Office." They also say important evidence was given urging that central pumping stations should be instituted; and Drainage Boards formed under authority of Parliament, to levy contributions and clear drowned mines from water, and though the Commissioners admit much good resulted from such a Statute obtained for South Staffordshire, they report against it "because it is always possible to apply for a private Act of Parliament." Surely the Coal Company recently drowned out in Tyrone, all the miners perishing, a fate from which a mining Board would infallibly have saved them, in reading that report might have been provoked and pardoned for Isabel's retort, "you bid me seek redemption from the Devil!"

This Royal Commission, while admitting 5,000 feet was so regarded on the continent, took 4,000 feet as a reasonable depth from the earth's surface for coal mining; and all coal seams one foot thick, and over for workable seams. The deepest coal workings in England occur at Pendleton in Yorkshire, where they are down over 3,000 feet.

The Commissioners report, that depth from the surface adds but little to the difficulty or expense of mining. Three seams of coal have been found five miles from the surface in the Mont Cenis tunnel, and at Bendigo, Australia, they are mining auriferous rock a clear vertical mile from the surface. None of the old Irish mines did more than scratch the surface; they had no diamond drill, and swift running machinery driven by steam or electricity to enable them to follow down the copper or other ore. In Tasmania the great Mount Lyell Copper Mine Company are finding the same payable ore at the 1,000 feet level, and like our small Wicklow Company are manufacturing most valuable manure out of the superphosphates.

Departments Controlling Mining in Ireland.

Instead of the Mining Board which Kirwan and Griffith desired to see empowered to control all mining in Ireland, Irish mining is controlled by the same Departments as regulate mining in England. The United Kingdom is divided into several mining districts. Ireland does not even form one such district, it is treated but as a suburb of Manchester, Manchester and Ireland together forming one mining district

under one mining inspector, who reports annually to the Secretary of State, Mr. Gladstone.

Both in Britain and Ireland the Legislature classifies all mines, other than Royal, as follows: All mines of coal, stratified ironstone, shale, and fire-clay, substances usually found interstratified, are made a class apart and regulated by the Coal Mines Regulation Acts, 1887 and 1894, "all other mines" are dealt with by "the Metalliferous Mines Regulation Acts, 1872 and 1875," while the Quarries Act, 1894, applies to "every place not being a mine in which persons work in getting slate, stone, coprolites, or other minerals, and any part of which is more than twenty feet deep," every such place is defined as a quarry. These Acts do not contain a definition of a "mine," and if this question should arise, otherwise than in legal proceedings, the Secretary of State's definition is made final, for most of these mines, and all of these quarries, are under the control of the Secretary of State, to whom the Mining Inspectors appointed under these Statutes to see their provisions observed, address their annual reports. Mines beneath the sea or foreshore—we have a nine foot coal seam under sea at Ballycastle—are under the control of the Board of Trade, while Royal Mines are managed and controlled by the "Woods and Forests."

I may say of the regulations and procedure prescribed for all these mines that a large proportion of them are not required to make any plans of their underground workings; that none are required to furnish such plans, except when the mine has been permanently abandoned, and that their evil and ruling principle seems to be secrecy and refusal of information to the public instead of its publication.

The Woods and Forests, so anomalously named, have a sub-office in Ireland; they never planted or preserved a stick of Irish timber, and their services to Ireland consist in the collection of an annual tribute from us of over £20,000, wherewith they beautify the London Parks.

The Woods and Forests issue "Take-notes," which are prospecting licences, with the right to exchange them for mining leases. They also issue mining leases. These "Take-notes" and leases are made out in the King's name, and in the name of one of the Commissioners, with the warrant of the Lords of the Treasury; these Take-notes and leases authorise mining for gold and silver in land where the Crown owns also all other minerals, in which case the royalty reserved is one-twenty-fifth, or authorise such mining in lands owned by private persons, in which case the royalty is one-fiftieth. If like rates were exacted in Australia it would cause many gold mines to be abandoned, yet these are "reduced rates" since 1906, at which date the Commissioners notified that *in future* if labour contracts were not performed the "Take-

notes" and leases would be forfeited. These forms recite the English Statute, but omit the Irish Statute I have adverted to, and sufficiently explain why mining for the precious metals has ceased, for these "take-notes" and leases on private property are only granted after the Commissioners have satisfied themselves that the applying licensee or lessee is the *owner* of the land (and contain an express declaration of such ownership), in respect of which such license or lease is granted. The Commissioners have, however, given a lease to Mr. Pritchard Morgan (of Welsh gold mining notoriety) of the right to search for and mine for gold in a large tract in Wicklow, provided he first obtain the consent of the various owners of that land;—for years Mr. Pritchard Morgan has done nothing but pay rent to the Department. In 1845 a London Company held such a lease for a considerable period, neither mining nor permitting others to mine. In Australia such practice is called "shepherding," and there neither the proprietors of the land nor the Crown would be suffered so to lock up national assets. The owners of the land are sufficiently protected by the provision made of filtering beds to prevent river pollution, and by their right of compensation for other injury. The right of the Crown in Australia to issue prospecting licences and leases to mine for gold and silver on private property, rests upon the same principles and law as obtain here, and there the Crown's right was contested, but thoroughly vindicated in the Australian Courts and on appeal to the Privy Council. Yet it is evident that the Woods and Forests are fearful of asserting this right, and as all the land here is privately owned, so long as the Department maintains its present mistrustful attitude, Irish gold and silver, of which I shall show there are probably large payable deposits in this country, might as well be non-existent.

⁵ Wm. and Mary, c 6, 4 Anne, c 12.

Millar v. Wildish, 2 W. and M. (Eq.), 137.

Woolley v. Att.-Gen. of Victoria, 2 App. cas. 163.

Different Practice in Australia.

Instead of several Departments, and a divided authority, in Victoria, and the other Australian States, they have each a Mining Department, and a Minister of Mines.

The Mining Department in Victoria issues all prospecting licences and mining leases of any part of the State or Crown lands, and of any licences or leases to search for or mine for gold or silver in private property. the royalty or rent reserved is little more than nominal; for mining on private lands, the rent is 6d. an acre, not to exceed thirty acres, but no rent to be less than £1 a year, ample labour covenants are inserted and enforced; or else the lease forfeited or transferred to a rival applicant, everything is done openly, and a plan

The Mines Acts, 1890 & 1897.

of all underground workings up-to-date must be forwarded at fixed intervals to be filed in the Department.

All mining information is collected and made accessible to the public by the Department.

Diamond drills, and the necessary skilled staff, are provided, which are always engaged in some part of the State in boring operations, which are chronicled in the Press. The pierced strata are brought up in the core of the screw, and the results recorded by the Department; the boring plant and staff are carried free on the State railway; and the plant for, and produce of, the mine will be carried at rates as low as consists with meeting the construction, up-keep and working of the railways. Central and local schools of mines are provided which thoroughly teach mineralogy and practical mining.

Victoria is divided into several Mining Districts, in which Bye-laws, sanctioned by the Legislature, regulate the local mining; amongst other salutary matters they provide for water rights and for compelling contribution to the cost of drainage and pumping operations necessary to free mines of water, from mine owners within the benefited area. Every stipendiary magistrate, sitting as mining Warden, administers swift and efficient justice in mining matters, subject to an adequate appeal.

For 5s. a year a miner can peg out and work a claim on any gold field; the State exacts nothing more from him. Every encouragement is given to seek for and reclaim for man's use the wealth which lies idle and concealed.

Irish Gold.

Sir Robert Kane tells us that towards the close of the eighteenth century gold "was accidentally found" in the beds of the streams which descend from the Northern flank of Croghan Kinshella Mountain, which lies on the confines of Wicklow and Wexford, at the junction of the granite ridge with the clay. Considerable quantities of gold were collected by the people: the gold was found both in massive lumps and in small pieces down to the minutest grain; one nugget weighed twenty-two ounces, others nine and seven ounces; the gold, accompanied by other metallic substances, was found dispersed through a kind of stratum composed of clay, sand, gravel, and fragments of rock, and covered by soil which sometimes attained a very considerable depth. Shortly after the discovery, Government took charge; the method followed was simply washing the auriferous dirt, the total quantity of gold collected by government in two years was 945 ounces, which was sold for £3,675, but the cost of mining operations, and unsuccessful search for the reefs, whence the gold came, exceeded the value of the gold obtained; the gold

was rich and malleable, and its assay gave to twenty-four grains, 22.58 of pure gold, and 1.42 of silver. I have extracted the foregoing from Sir Robert Kane's book,* which states that, some years before 1845, the gold mining was leased to a London Company, under whose direction workings were made in a very imperfect and trifling way; but, the author adds, the sources of the gold were never found, and still remain a mystery, and will, I say, ever remain a mystery, till the Woods and Forests tell the land owners their consent is unnecessary, and permit the mining prospector to get to work.

The mining operations above described were of the rudest and most primitive character; the most likely places, including many miles of the old beds of the streams, were not prospected; while, since then, the "Giant-nozzle" and amalgam plates both find the gold far more efficiently, and secure it from the thief, while doing in hours, work which would formerly occupy weeks. Recently the Woods and Forests were informed by an expert that the gold was certainly present in payable quantity, but was probably stolen during the operations. An experienced Australian gold mining prospector, allowed to "loom" and assisted to "trench," when necessary, would soon trace the gold to its home in the rock, when, not improbably, gold-bearing reefs would be found. Rocks which shed gold nuggets nearly 2 lbs. in weight are there, and are worth the search; the extraction of gold from such rocks is not, like alluvial mining, a matter of a year or two, but is both far more permanent and profitable. Such operations have been in progress at Bendigo for over half a century without showing indication of exhaustion.

In this part of Wicklow, the Connoree Company, which has paid £10,000 dividends in one year, mined a lode of decomposed iron pyrites, from 3 to 30 feet wide, containing $\frac{1}{2}$ oz. gold, 6 to 12 ozs. silver, and from 1 to 3 per cent. of copper to the ton. Such a mine would, in Australia, be considered a gold mine of extraordinary richness.

A very exact observer, Dr. Boate, writing of Ireland two hundred and fifty years ago, reports that gold was also found in Donegal.

Donegal.

In 1905, four hundred tons of lead, containing 4,000 ozs. of silver, was mined at Glentogher, Cordonagh, in the Co. Donegal, valued at £4,800; and in 1906, 1,400 tons, valued at £2,800, was extracted, the lead ore containing gold and silver, but amount not ascertained.

These values are always stated by the companies or persons working the mines; it is their interest to underestimate the value, and no doubt bulk rents or royalties are first deducted.

* *Industrial Resources of Ireland*, pp. 208-9.

Coal.

The Royal Coal Commissioners stated it was most satisfactory to note that 79.3 of the British coal supplies were contained in seams one foot thick and upwards; but they had no figures to show what proportion of Irish coal was so circumstanced. All of the coal mentioned herein lies in such seams.

The Sub-Commissioner appointed on that occasion to inquire about our Irish coal paid us but a flying visit, and that only to the Leinster coal field and to Tyrone.

He reported very encouragingly respecting the Tyrone coal-field, where we have about forty feet of coal within a shorter distance of the surface than a like thickness of coal can be found in any other coal-field in the United Kingdom, a fact to which Sir Richard Griffith called attention; the report states that the coal-field "is unquestionably of great economic importance, containing large quantities of bituminous coal, which has scarcely been disturbed, in this large district. . . . Want of enterprise and capital, exceptional in Ulster, appears to prevent the opening up of a large mineral field in this county, capable of supplying fuel for the mills and factories of the surrounding country."

I shall show presently the real cause of such apparent neglect. There are 18 million tons of coal in this district.

The Sub-Commissioner reported that the Ballycastle coal district was "practically exhausted," whereas, admittedly, there are fifty million tons of coal proved to be forthcoming there—and an inquiry of the Geological Survey Office would have ascertained the fact. Messrs. Symes and A. McHenry reported on this coal-field in 1888, and the results are published in the Geological memoirs of that year. Mr. A. McHenry, who is a native of the Co. Antrim, and admitted to be more familiar with the geology and mineralogy of that county than any other officer in the Irish Geological Survey Office, is of opinion that systematic and judicious boring would prove that valuable and extensive seams of coal underlie a large proportion of the area of the County, and that we have concealed there not millions, but billions of tons of valuable coal. Professor Cole, the head of that office, while not adopting that opinion, admits it may be so, and states that Mr. McHenry's opinion is entitled to very great weight.

If that opinion be accurate, and which can only be determined by very extensive and expensive boring operations, the minerals may be more valuable than the agricultural or pastoral value of the land. 174,458,000 tons was stated in the Sub-Commissioner's Report to be the nett available coal tonnage capable of being profitably extracted in Ireland, whereas it is now admitted that from the Jarrow and Skehana seams alone the Leinster coal-field has 180 million tons available.

In Connaught they have from twenty to thirty millions of tons available in the Arigna, Co. Leitrim, district, where their price for the best coal is, at the pit's mouth, 11s. 6d. a ton. The Cavan and Leitrim Railway burn this coal, and none other in their engines, obtaining results equal to that of the best Welsh steam coal. Transit difficulties are the trouble with the companies mining this coal, and the bonus in the shape of "through" rates given by the Railway Rings to British coal owners sending coal into Ireland.

It costs 2s. a ton to cart the Arigna coal to the nearest railway station, and 6s. a ton for 50 ton lots for rail carriage to Dublin; carriage by the Grand Canal, 8s. a ton.

The Leinster coal-field occupies part of three counties, Kilkenny, Carlow, and Tipperary.

The Castlecomer Collieries, Kilkenny, have been worked for three centuries. The Jarrow and Skehana seams are now being worked. Square miles of the Skehana coal underlie peat bog. The coal is an anthracite, of quality not surpassed, if, indeed, equalled, by anything in the United Kingdom.

The Railways circle round the collieries, keeping at a distance of six miles. The Great Southern and Western Railway Company of Ireland, though proffered the land free, have refused to construct the missing link. Before the railway era, Castlecomer coal used to be supplied over a circle of sixty miles from the collieries; now the railways supply those districts with British coal, cheaply carried at through rates. Castlecomer coal is hard, compact, and smokeless, fetching 15s. a ton at the pit-bank; it costs 5s. to 6s. a ton to cart it to the nearest railway station or canal, and 3s. 4d. a ton by rail or canal to Dublin; carriage, 9s. 4d. a ton!! for coal within almost cannon shot of us.

Until Ireland's railways and canals are nationalised, and the contracts broken which make them the bond-thralls of British Railway Rings, coal-mining and most other Irish industries are hopeless.

Here are the analyses of the

CASTLECOMER COALS.

		Jarrow Seam.	Skehana Seam.
Carbon	88.06	93.81
Hydrogen	2.49	2.73
Oxygen	0.55	0.86
Nitrogen	0.84	0.85
Sulphur	1.81	0.60
Ash	6.25	1.15
		100.00	100.00
Calorific power, Fahrenheit	units,	Jarrow,	.. 13732.2
"	"	Skehana	.. 14599.8

Mr. Pryor Wandersford is about opening up the Skehana seam on a large scale, and erecting the most modern machinery. He has recently, by boring, proved that the valuable Skehana seam covers a far wider area than was previously known to be the case.

An expert and disinterested witness gave the following evidence respecting this coal before the last Royal Commission: "It is a very remarkable fuel. You can light it, and you can leave your fire, and it will burn from twelve to sixteen hours."

"It is only being raised at about 100,000 tons per annum."

Lord Allerton, the chairman, in surprise, asks, "What delays its development?" Witness replies, "There are no means of transit."

"What," asks the chairman, "are there no railways in Ireland?" He is answered "Yes," but none approach the coal, and that the Irish Railways are occupied carrying British coal, with which, therefore, the cart-drawn Castlecomer coal cannot compete. With State Railways, a siding, and his own waggons, the coal should be carried to Dublin for 1s. 6d. a ton, instead of from 8s. 4d. to 9s. 4d. per ton. If we burned this coal in Dublin instead of foreign, it would banish our fogs. Might not the Agriculture and Technical Department make a beginning?

The proprietors claim that in this coal, applied to gas engines worked by producer gas, they have the cheapest power known, next to water power. No gasometer is required; a ten horse-power engine can be run at 1d. per hour, taking the anthracite at 20s. a ton. Nine-tenths of a pound of this coal per brake horse-power per hour is sufficient for a thirty brake horse-power engine. Even with gas at 2s. per 1000-foot cubic, the gas would be five times more costly. In 1845 Sir Robert Kane wrote that ten pounds of coal per hour would produce one horse-power. Two or three years ago this cost was got down to two pounds an hour. With every cheapening of power, the relative superiority England has from her larger coal resources is reduced.

From these figures there seems to be no reason why we should not have Irish Factories spinning here as cheaply as in Lancashire.

Under the head of "The World's Coal Supply," there appeared in the *Irish Times* of 28th January last a report of the proceedings of the annual general meeting of the Engineering and Scientific Association of Ireland, and of the reading thereof of a paper entitled, "The World's Coal."

No one could suppose from reading that report that we had any coal worth extracting in this country. The writer of that paper stated the consumption of coal per horse-power per hour was now about six or seven pounds an hour, that it:

ought to be less than three pounds; but no one present seemed to be aware of what I have stated respecting the superior economy of the Skehana coal, nor that Mr. Jeans, probably the highest authority, had stated before the Royal Coal Commissioners, who reported in 1905, that the coal cost had already been got down in Great Britain to two pounds of coal per hour.

The patriotism which dictated the advice that we should burn everything which comes from Britain except the coal is to be preferred to that which depreciates and disparages everything because Irish.

Our Irish stock-brokers and engineers have much to answer for.

Irish Iron Ores.

Sir Robert Kane says the quantity of iron-stone in the Arigna district is practically inexhaustible, and he tabulates a comparative analysis of it and of English, Scotch, and Welsh ores which I annex, prefacing this, that, since 1845, when this analysis was made, the richer British ores have been so far exhausted that now the average British Ores, *as calcined for the furnace*, do not exceed 38 to 40 per cent. of metal.

ANALYSIS SHOWING PERCENTAGE OF PURE METAL.

Name of the Iron-stone.	In its Natural state.	As calcined for the furnace.
Arigna Ore—		
Richest	42.3	61.4
Poorest	37.7	53.2
Common Staffordshire—		
Richest	40.5	60.0
Poorest	28.0	40.4
Ordinary Welsh—		
Richest	42.1	60.0
Poorest	31.4	44.7
Ordinary Glasgow	31.6	45.8
Mushets Black-band	41.0	63.1
Average Kilkenny Ore	38.7	55.3

Wales has exhausted her iron ores, and relies entirely on imported ore.

Sir Robert Kane says, in 1845, of above figures, "there is hence no doubt that the iron ores of the Leinster and Connaught coal-fields are equal, and even in average superior to those generally employed in Britain; the iron-stone of

Kilkenny is but little inferior to that of Arigna ; whilst the ores of Lough Allen attain a richness in iron only equalled by the Black-band ironstone of Glasgow. Since then, this Glasgow Black-band iron-stone and coal measures have been recognised as occurring in Antrim about Ballycastle." See explanatory memoir of Messrs. Symes and McHenry, published in 1888 by the Geological Survey. Sir Robert says we have also in great abundance the clay iron-stone, which is almost the exclusive source of Britain's iron ; and he refers to and adopts as thoroughly accurate at the present day Dr. Boate's report of the three classes of Irish mines, including " Bog mines," published two hundred and fifty years ago. Britain was supplied, while our forests flourished, with iron from Ireland, and without any apparent diminution of our iron stores. Sir Robert Kane reminds us that in order to smelt and produce iron profitably there must be the following materials on the spot, namely building materials for the furnaces, which must be formed of infusible sandstone and of the most refractory bricks ; for which purpose fire-clay is necessary, lime to make a flux, and coal to smelt it ; all these substances, he says, are abundantly found collected together on the spot.

In Wicklow, prior to 1856, a large bed of " gossan," an excellent brown hematite iron, was worked for a width of one hundred feet as a quarry ; the ore is stated to have been then worth from 15s. to 16s. a ton.

Great Britain in 1902 imported 6.3 million tons of iron ore, of which 98,485 tons were from British Colonies, and each year larger quantities are imported. By the importation of these ores the average of Home-British ores, *as calcined for the furnace*, a process which increases the percentage some fifty per cent., is raised from between thirty-eight and forty to between forty and forty-three per cent. These figures, and what follows, I have extracted from the evidence of Mr. Jeans, Secretary of the British Iron Trade Association, published in 1904, by the Chamberlain Commission on Iron and Steels. Mr. Jeans says the ultimate value of the iron trade product exceeds that of any other industry. In his evidence, Mr. Jeans, says that it may almost be said that the ore supplies on which the iron industry of Britain was mainly founded have been entirely exhausted ; that within the past sixty years new supplies have been obtained, but, except those on the N.W. coast, are of poor grade, the ores not containing much more than thirty per cent. of iron. Mr. Jeans nowhere mentions Ireland ; but it would seem from his evidence that a profitable export market for our iron-ores or for pig-iron now exists in Britain.

About 130,000 tons of iron-ore, worth over £20,000, is annually raised in Antrim.

Copper, Rock-salt, Marbles, Clays, &c.

Sir Robert Kane states we have much valuable copper ore in Wicklow, Waterford, Cork, Kerry, and elsewhere; and that at Muckross, near the Lakes of Killarney, from 1749 to 1754, they mined a lode of copper pyrites five feet wide with great profit, and abandoned operations only because of difficulties arising from the great European war; in extracting this copper, an extremely valuable mineral "treasure of cobalt," was found in great quantities, and its value not being recognised, was thrown into the lake—but one of the miners got away first with twenty tons of it.

At Ross Island, Killarney, they raised about two hundred tons a month of copper ore, worth from £14 to £40 a ton, the whole averaging £20 per ton.

This mine, though worked most extravagantly, was profitable till the lake, bursting in, stopped all operations.

In Tyrone, Sir Robert Kane analysed grey sulphuret of copper which contained eighty per cent. of copper.

For particulars of many Irish minerals—marble, stone, fire-clay, and clays for pottery and porcelain, etc.—I would wish to call attention to very valuable papers read in October, 1902, at the Industrial Conference held in connection with the Cork International Exhibition, by Mr. Lyburn, mining engineer and adviser on mining to the Agriculture and Technical Department of Ireland, on "Minerals and Mine and Quarry Development in Ireland (and in view of Mr. Lyburn's description of our quarries and clays, the action of the Board of Works, in deciding to import nearly all the stone from England for the purpose of building the Royal College of Science, Dublin, which should be a standing monument of the beauty, utility, and durability of Irish stone, pottery, and marble, cannot be justified or sufficiently resented); and by Mr. Rix, late manager of Doulton Art Pottery, on "Irish Clay Working and Pottery Industry"; and by Mr. Charles Spackman, on "The Manufacture of Portland Cement," all published by the Agriculture and Technical Department.

In a book entitled *The Mines of Wicklow*, published in 1856, and which, though anonymous, seems trustworthy, and shows very intimate and detailed local knowledge, it is stated that the metallic richness of the copper and sulphur lodes and beds of Ovoca has seldom been equalled in any country; that the copper ore at Ballymurtagh was in many places thirty feet wide; the average of sulphur in the principal lode also thirty feet wide; and that in the great North lode in some places sixty feet wide of solid ore was proved without reaching the limit. A strange fact, attributed at the time to chemical action of the copper was, noticed in the Connoree

mine in this district, namely, the temperature went up to 120 degrees Fahrenheit, as was supposed, owing to chemical action of the copper; this writer states there are large and rich lodes here, never touched, sufficient to keep the miner profitably employed for centuries; native copper twenty-eight pounds in weight has been found, and at date of publication the United Kingdom was depending on the Qvoca and Aughrim Pyrites beds for her entire supply, 100,000 tons per annum of bisulphuret of iron—an output easily capable of being doubled. This book tabulates the late Professor Haughton's figures showing the quantities and values of minerals extracted by various companies mining in Wicklow.

In 1853, the Mining Company of Ireland declared a dividend of fifteen per cent., and showed in the first Dublin Exhibition very fine and massive specimens of Irish ores, silver-lead, and iron pyrites raised in the Counties of Dublin, Wicklow, Wexford, Waterford, Limerick, Cork, Clare, Galway, Mayo, Leitrim, and Down.

In 1845, Sir Robert Kane regretfully stated that we had no rock-salt in this country; but a few years later the Marquis of Downshire bored near Carrickfergus for coal and struck a bed of rock-salt two hundred feet in thickness, which continues to give profitable employment; about 40,000 tons of a superior quality is annually raised at Carrickfergus, valued at £11,000. The works are owned by the Salt Union, Ltd., of Cheshire. Mr. McHenry, of our Geological Survey, is of opinion that the Diamond-drill would prove other rich Rock-salt beds exist elsewhere in the same county.

Rich aluminiferous earth, from which the useful metal "aluminium" is made, according to the same authority, is found in large and payable quantities also in Antrim.

Suggestions.

That an Irish Mining Department be formed in connection with the Agriculture and Technical Department, and that all duties, emoluments, and powers relating to Irish minerals, mines, and quarries now vested in the Irish Estates Commissions, the Secretary of State, the Board of Trade, and the Woods and Forests (including all Royal Mines) be transferred to the Irish Mining Department, and that plans of all underground workings and reports of all borings be filed in said Department.

That a Mining Survey of the whole of Ireland be forthwith made, and that the various minerals be indicated thereon, both by their scientific and commercial names.

That Schools of Mines, including mining chemistry, be formed in such places as the Mining Department shall think fit, and under the control of the said Department.

That the sheet maps, showing the mining survey of their particular county, be displayed in the Board-rooms of every Urban and County Council, together with specimens conspicuously labelled, of all minerals described on the mining survey maps of such county; and that such maps shall also be displayed in the principal room of every primary school, and the principal reading room of every Public Library in such Urban District or County.

That the necessary funds for the foregoing purposes be provided by Parliament.

The Nationalisation of our mines and mineral rights, and the fact that the Legislature has so recently recognised the necessity of boring operations to ascertain what minerals and metals we possess, before the Commission shall sell or lease them, is both a confession on the part of the Legislature of past neglect, and of our present right to remedy, and to the necessary funds for this national purpose.

“The fairest grant is the necessity!”

Is not Ireland also justified in demanding an Irish Mining Board, and at least, respecting these matters, to say to the Imperial Parliament: *Give me an account of thy stewardship, for thou mayest be no longer steward.*
