THE ROYAL GEOLOGICAL SOCIETY OF CORNWALL

Its Origins and History, based upon its official Minutes, Reports and Transactions

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" The pyramids themselves, doting with age ", said the seventeenth century divine, Thomas Fuller, " have forgotten the names of their founders ", an observation that applies also to human institutions that have escaped the hardened arteries and coronaries of middle age. The Royal Geological Society of Cornwall that is now approaching its one hundred and fiftieth birthday in Penzance has the enviable distinction of being the second oldest body of its kind anywhere in Western Europe, if not in the world, its foundation in 1814 being preceded only by that of the London Geological Society in 1807, though what it lost in priority it more than gained in royal patronage. In a sense, although there were a good three hundred miles of rough country between London and Penzance, the Society at the extreme west of Cornwall was a natural extension of that in the metropolis, though there were never any constitutional links between them. The London Geological Society had been formed as a specialist agency to combat the liberal domination of the Royal Society by its President, Sir Joseph Banks ; its founders were Fellows of the Royal Society ; and several of them were Cornishmen distinguished in one way or another for their contributions to the technological revolution when steam power was applied to the problems of the mining industry. It was natural, of course, that the field centre of the comparatively new science of Geology should be Cornwall, where the opportunities for research into the mysteries of the age of the earth had first been brilliantly exploited by Thomas Beddoes, the Bristol physician, but it is doubtful whether a society would have been formed there so soon to study it but for the power and influence, scientific and political, that these Cornishmen exerted in the corridors of Westminster and in the rooms of the Royal Society, notably Lord De Dunstanville of Tehidy, Humphry Davy and Davies Gilbert.

Of the three Davies Gilbert was the most influential, for he was President of the Society from its inception in 1814 until his death in 1839, though De Dunstanville was close enough to the ears of Royalty to persuade the Prince Regent to become its Patron, while the magic of Davy's name brought Penzance into the intellectual streams that flowed between Bristol, London, Paris and wherever he happened to be wandering in Europe. Gilbert was born at St. Erth in 1767, educated at the Penzance Corporation Grammar School and Pembroke College, Oxford, was one of the most powerful personalities to come out of the West, and remains one of the best examples of the then new " public man ", almost entirely without personal ambition, who was dedicated to the business of government and the intellectual patronage of anyone less favourably placed than himself. He was member of Parliament first for Helston and then Bodmin for twenty-eight years, and at the House of Commons distinguished himself as a sound committee man on a whole range of topics : finance, bullion, the

standardisation of weights and measures, steam engines, the Corn Laws, the Poor Law and parliamentary corruption; and he was once favoured as Speaker in succession to the redoubtable Charles Abbot. He was one of the outstanding mathematicians of his day — " His face ought to be perpetuated in marble for the sake of mathematics ", said Southey — and unofficial adviser in mechanics to the Cornish engineers Richard Trevithick and Jonathan Hornblower. He was an authority on the new engineering of bridge building — Telford's suspension bridge over the Menai Straits was strengthened by his theory of the catenary curve — and he established the first observatory in the southern hemisphere at the Cape of Good Hope. Politician, civil servant, classical scholar, farmer and landowner, chemist and mechanical engineer, magistrate, sheriff and deputy-Lieutenant of Cornwall, he moved in a wide circle of friends and acquaintances that included Pitt and Fox, Peel and Canning, Liverpool and Wellington, Sir John Franklin the explorer, James Watt the engineer, J. F. W. Herschell the astronomer, as well as the Beddoes', the Wedgwoods, the Edgeworths and the Darwins, so that he stood at the very centre of all that was radical and progressive in the political and scientific life of England. Today the only immediately visible tributes to his memory are the portraits of him in the rooms of the Royal Society and the Royal Geological Society of Cornwall, the plaques on the walls of the churches at St. Erth and Eastbourne and the Davies Gilbert mountains in Alaska. It is not surprising therefore that when the scaffolding of the Royal Geological Society in Penzance was rigged by men of this calibre, it had a look of permanence and an atmosphere of intellectual distinction, and especially when Sir Joseph Banks, the veteran President of the Royal Society, died in 1820, for the Society provided its next two Presidents, Davy and Gilbert.

Scarcely less capable, though in a more specialised way, was its real promoter, Dr. John Ayrton Paris. Born in Cambridge in 1785, and a graduate of Caius College and of the University of Edinburgh, where he studied chemistry and medicine, at the age of twenty-three he was physician to Westminster Hospital and already distinguishing himself for a course of lectures on the new subject of " pharmaceutic chemistry ". Strange as it may seem, in 1813 he left London for Penzance to take over the practice of Dr. Bingham Borlase, but in those days West Cornwall was, medically, a source of profit, for here wealthy invalids congregated for the winter. He was there for four years only, but during that time this young man, destined to become in 1844 the President of the Royal College of Physicians, impressed his personality on the whole neighbourhood, not only on account of his medical skill, but because of his concern for the advancement of science generally, and especially Geology. A Fellow of the Royal Society, he it was who took the initiative in calling a public meeting on Friday the 11th of February, 1814, at the Union Hotel in Chapel Street to determine whether an institution for the study of Geology could be promoted. Geology, he said, was a subject of singular interest that seemed capable of bursting the units of time as astronomy had done those of space, and of unveiling the traces of those various and awful revolutions which had convulsed the surface of the globe in its infancy. This was as much the concern of the theologian as the man of science, for he was able to confirm by reason the truth of that which he already

believed through faith. But Geology was as much concerned with the here and now as with the hereafter, and of interest, not only to the theologian and the historian, but also to the miner and the farmer. Through its study, he went on, he hoped to be able to promote specialist investigations into the right use of manures in agriculture, granite in building, clay for the manufacture of china, but most of all the techniques of mining. And indeed he did give a series of papers in " explanation of a New Geology ", and another on the links between geology and agriculture to explain how the chemical analysis of rock could account for some areas of Cornwall being barren and others fertile.

It is important, perhaps, to remember the initial aims of the Society in an age when Natural Philosophy was soon to become known as Science, and the Royal Society was to exclude Anglican parsons because they were " amateurs ". In Cornwall the study of Geology was to be broadly based and liberal in its approach as might be expected since its promoters were themselves men of a liberal education. For instance, the first librarian of the Society was the Rev. Charles Val Le Grice, the literary critic and friend of Coleridge, who could lyrically enthuse that Penzance was the ideal centre for the study of Geology since it was " a theatre in which geology displayed all her powers ", that " Cornubia " should not " recline in supreme indolence and ignorance among these glorious monuments of Nature as the Turk does at Athens ", that all knowledge leads to God, and that " the clearer the view of the wonders of creation, the more that the veil is lifted from our eyes ". For Davies Gilbert the Society was to have all the qualities of which Lord Bacon had approved, and particularly that it would be " the sweet road to improvement ", by which he meant two things ; the improvement of the mind, and its application to the problems of the mining industry.

From the beginnings the Society has been a blending of professionals, competent " amateurs " and mining specialists, whose reputations soon spread beyond the borders of Cornwall. For instance, in the very first year their advice was being sought by Sir Ralph Milbanke, President of the Society for the Prevention of Explosions in Coal Mines. Among its honorary members were to be found Sir Joseph Banks, Sir James Hall, Lord Webb Seymour, Professor John Playfair of Edinburgh, Dr. Thomas Thomson the Professor of Chemistry at Glasgow, George Bellas Greenough the first President of the Geological Society in London, Sir Humphry Davy, Sir Edward Smith the President of the Linnean Society, Dr. Edward Clarke the Professor of Mineralogy in the University of Cambridge, Dr. John Hailstone the Woodwardian Professor of Mineralogy at Cambridge, Dr. John Kidd the Professor of Mineralogy in the University of Oxford and Dr. Wollaston the Secretary of the Royal Society. Among the local " amateurs " were the first treasurer Henry Boase, a man of marked social purpose who had once been a member of the central committee of the London Missionary Society, had taken part in the founding of the London Bible Society, was one of the earliest suppoters of the elementary schools of Joseph Lancaster, and the promoter of the first Savings Bank in Penzance ; Joseph Carne whose private collection of minerals was to be the core of the Museum ; Robert Were Fox, an authority on steam engines, adviser to the Admiralty and the

inventor of the deflector dipping-needle ; his equally distinguished brother Charles, co-founder of the Royal Cornwall Polytechnic Society in Falmouth and the man responsible for introducing into Cornish mines the man-engine that he had first seen working in the Harz Mountains in 1839 ; Ashurst Majendie, who began the Society's collection with a complete series of rocks of the Lizard, the Land's End and the Isles of Scilly districts ; and John Davy and John Paris with their first papers on the geological structure of the south-west coasts, the granite veins at Porth Just, and the sandstone of the north coast of Cornwall, and who initiated the first discussions on the change of texture which stratified rocks undergo as they approach granite. Among the " amateurs " too were to be found the politicians, men like William Rashleigh of Menabilly, J. Jekyll the Attorney-General of the Duchy of Cornwall and Davies Gilbert himself, who confessed to knowing little about mineralogy but thought he could assist the Society because " the nature of his public duties required his residence during a great part of the year in London where he was fortunately in habits of intimacy with some of the most distinguished and efficient characters in the scientific world ". Hardly less influential was the first patron, Lord De Dunstanville, who admitted that though he had made no study of geology and it was too late in life for him to start, yet " he duly appreciated the interesting nature and valuable objects of the Society's pursuits which he should be happy to promote by the only means in his power, by contributing to its pecuniary expenses — indeed he knew no greater pleasure that could be enjoyed by those on whom Providence had bestowed a large share of temporal blessings than to increase knowledge and foster science by aiding the labours of others ". He was a man of his word, and the Society gained a royal patron and one hundred guineas.

Among this galaxy of talent and genteel influence that gave the Society its first social drive and power were also working miners and engineers. Davies Gilbert in a letter, dated the 8th of May 1815, to the Rev. D. Lysons (British Museum Add. Mss. 9416-20) says that the inaugural meeting of the Society " was attended by great numbers of the most respectable and best informed among the Gentlemen and Miners ". Some of these perhaps included the adventurers of Dolcoath, Cook's Kitchen and Huel Fanny who, between them, contributed fifty guineas " for building a Museum and for defraying the expenses in forming a Geological Map of the Mining Districts of Cornwall ", a map described in the most liberal terms as " a present from Geology to Agriculture as it shows the interesting connection between the soils and the rocks " and as " a present from Geology to the Arts . . . by shewing the products peculiar to particular districts and by leading to the discovery of those which are the more immediate objects of commercial industry ". Those two titans of the beam engine, Samuel Grose and Arthur Woolf, were members and also their turbulent rival Richard Trevithick, elected on the 10th September, 1816, but six weeks before he boarded a whaler in Penzance harbour to try his fortunes in Peru, promising to send back to the Society " a series of specimens illustrative of the mineralogy and geology of that extraordinary country ", said Davies Gilbert. Another was the mine captain Richard Hodge of St. Erth, elected in 1823 in absentia because

he was " at present superintending the silver mines of Peru ", the first of many who were to extend the reputation of the Society to the Americas as the Council Report of 1825 observed : " It is expected that in future a regular correspondence will be maintained with the United States ; and from the great number of our countrymen who have gone out to America on the new mining expeditions, much useful information may be obtained from the almost unexplored regions of the Western Hemisphere ". Then there was John Rule, whose survey drawings of Dolcoath mine were incorporated in Sir Henry De la Beche's *Report on the Geology of Cornwall, Devon and West Somerset ;* he became the resident superintendent of the Real Del Monte silver mines to the north-east of Mexico City, wrote several articles for the Transactions, and finally was a Vice-President of the Society. Samuel Higgs was Secretary for thirteen years until he became superintendent of the copper mines of Wallarod on Yorke's Peninsula in South Australia. Perhaps the most famous was Richard Pearce of Redruth, known throughout the American mining world as the "uncrowned king of Denver ", where his great mansion on Sherman Street was an ever open house for the Cousin Jacks of Central City, the inventor of new processes for separating gold from its associate metals that made Central City the richest square mile on earth, the discoverer of uranium in Colorado — he sent the Society some in 1871 — and the popular British consul in Denver for almost twenty years, returning finally to Cornwall to become President of the Society in 1904. And there was even a shoemaker from Liskeard who read a paper on geology at the anniversary meeting of 1849 which showed " how much may be done even with small opportunities and how wide is the field of science which includes men of all classes ".

The link with mining and the men " of all classes " is a theme that runs through all the annual speeches of the presidents, for one of the rules of the Society proposed by Paris was that at the anniversary meeting one member should be appointed to deliver " an oration in which he shall be required to take a view of all the important geological discoveries which have been made in any part of the world in the foregoing year and he shall deliver a comparative statement on the condition of the mines in Cornwall ". Moreover, the Council Report for 1815 emphasised that " the miner has been entrusted to our service " and drew attention to " the grand objects of the Institution . . . by which the obscure art of mining will be improved, the health, comfort and life of the labourious miner ensured, and the political resources and opulence of the County augmented ". John Forbes, the secretary who succeeded Paris in 1817, talked of science as " a noble freemasonry " that united " in bonds of friendly fellowship all its cultivators without regard to kindred, tongue or nation ", and exhorted all members to go out into the fields to collect specimens for their " still very defective geological map ", since " the farmers and miners in any part of Cornwall could give this information to any gentleman that would take the trouble to record it ". And one of his first papers to the Society in 1818 was on the theme of " the importance of Mineralogical and Geological Knowledge to the practical miner ". Again, in 1841, Sir Charles Lemon, who succeeded Gilbert as President, spoke of the " science of geology tending to pour its stream over the being and

happiness of that important class, the practical miners of the County". In 1864 at the laying of the foundation stones of the present municipal buildings and museum of the Society in Penzance, the President, Charles Fox, reaffirmed the original aims of the Society thus: "Hitherto we have been like a miser exhibiting but few of his treasures and then as if by stealth. To make due arrangements for this we hope, by liberality from all classes, to raise the fund from £2,200 in hand, or promised, to £2,600 — I say all classes, for the agriculturalist, the skilled artisan and the fisherman have a vested interest in geology". And in 1870 his successor Warington W. Smyth declared: "Our main object now is to promote branches of scientific instruction in which this country is most concerned. The aid of science is now more than ever required to enable miners to bear up against the competition which is everywhere on the increase against them". The Society, of course, was concerned primarily with the disciplines of the new study of Geology in a unique field setting. The first paper to be communicated was by Ashurst Majendie who spoke on "the viens of granite traversing the shisters at Mousehole". Sir Joseph Banks was supplied with information about the formation of Perran Sands. The first books to be placed in the library were De Luc's *Geology*, Accum's *Crystallagraphy*, Cuvivier's *Essay on the Theory of the Earth*, Thomson's *Annals of Philosophy*, Pinkerton's *Petrology* and Davy's *Elements of Chemistry*, while Davies Gilbert "presented a Logometric Scale of Chemical Equivalents". There were two specialised committees at work, the Chart Committee to construct a series of charts illustrative of the Geology of the Cornish coast, and the Committee of Nomenclature "to collect all provincial expressions which are connected with mineralogy". Yet the link with the county's main industry was always to the fore. When the first Transactions were published the price was to be "not too high to prevent them circulating among mine captains". In 1823 the Society recommended that the tin stream works of Cornwall needed scientific investigation. In 1847 a new class of membership at a fee of five shillings a year was instituted to bring in "intelligent miners who have deserved the thanks of the Society for their presents of minerals and for the practical information which they have communicated". For their subscription these associate members could receive the Transactions gratis and visit the Library and the Museum, though their numbers perhaps were never very significant. Only four applications, it seems, were received in the first year, from Burncoose, Truro, St. Agnes and Falmouth, though it was hoped that more would be induced to join from the recently formed Scientific and Literary Institution at St. Just.

In the early days the problems associated with conditions in the tin and copper mines appeared regularly on the agendas. Less than two months after the Society had been formed Sir Rose Price, the West Indian sugar planter, drew attention to the excessive number of explosions in mines caused by iron rammers, demonstrated a safe tamping bar made of copper and tin invented by one of their Council, William Chenalls, "a mine agent of great knowledge and experience in the parish of St. Just", and persuaded the Society to undertake the responsibility of sending twelve of them to "the captains of the leading mines" for their comment. Chenalls had also

invented the " shifting cartridge ", a contrivance for delivering a measured charge of gunpowder to the bottom of the holes for blasting rock and for preventing the powder from sticking to the sides of the hole. Twelve of these were also ordered for distribution among the mine captains. Alarmed by the excessive numbers of women and children thrown on parish relief by mining explosions that had been revealed by enquiries from " the Clergy, medical gentlemen and parish officers ", Paris prepared a special *Essay on Explosions in Mines*. This the Council ordered to be laid before the judges at the Lent Assizes in 1817 at Bodmin, and Mr. Justice Abbot charged the juries with the necessity of impressing upon the mining interests the importance of introducing the safety tamping bar and the shifting cartridge. Furthermore, the Society made itself responsible for printing " on cheap paper " an accurate description of the manner of making them " as will enable any common blacksmith to manufacture them ", and sent these designs to the agents of all the mines in Cornwall, the ministers of every parish, and all the county newspapers. So successful was the campaign that the Council Report for 1817 claimed that the safety bar was in use in all the western mines, and there had not been a single accident for two years. Chenalls was awarded a special medal for " his zeal in forwarding the views of the Society ", and as he himself said, " if the Geological Society had never produced any other good than the distribution of the Safety Bar through the mines of Cornwall, you would have the satisfaction to know that it had not existed in vain ".

Unfortunately the mining world seemed less concerned about the welfare of the Society, and its apparent indifference was difficult to explain. To overcome this, in 1841 Sir Charles Lemon and William Praed offered £10 a year to be distributed in small sums of not less than ten shillings each to working miners who would report to the Society any unusual occurrences that came to their notice: " The object of this premium is to place the actual miner in immediate relation to the Society and to awaken in his mind an attention to those anomalies which frequently present themselves in his pursuit, the scientific value of which may by no means be heeded or understood by him . . . To him they may be only strange appearances, or at best, objects of admiration or curiosity ; but there may still be truths of great importance concealed under such departures from the ordinary course of nature, truths which may have a direct tendency to flow back on the miner himself through the channels of science ". But the scheme did not prove attractive — some said that it was because of the reluctance of the miner to put pen to paper, which was not surprising since few of them had any formal education — and after twelve years the Council was reluctantly complaining: " It is also still a matter of regret that amidst the general prosperity of the mines, the respectable and well-informed agents cannot find time to communicate to the Society any particular circumstances which may have occurred in their departments during the year ". There is some evidence, however, that the miners, if not the agents, had produced information, though its reception does not seem to have been encouraging if the Council Report of 1849 is to be believed: " While it gladly welcomes these communications, they would intimate that they were much more anxious to obtain facts than theories. The latter can be useful only

when they are based on a large accumulation of facts ; but they are more likely to retard than to aid the progress of science when they have only a few insulated facts for their foundation ".

More disappointing had been the failure thirty years earlier of a most promising development of Paris who saw the Society, not as a body of academics, but as the provider of a service to the mining industry with a paid permanent director of policy. In 1817 he proposed that the Society should establish a Professorship in Mineralogy, the duties to consist of lecturing in the mining towns and to students in a school of mines to be established under the aegis of the Society. On the 21st February, 1817, the Council produced a series of resolutions in favour of the idea :

> " That the pursuit of Science in the County of Cornwall must necessarily advance its Mining, Commercial and Agricultural Interests and that the neglect of it has often been felt and acknowledged,
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> " That there appears to be no method more efficient towards cultivating and diffusing Science than the encouragement and support of the Royal Geological Society,
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> " That the increasing importance of the Society and the extent of the objects which it embraces require the first-rate talents and science to conduct it and that the only way in which they can be commanded is by the establishment of some office with an appropriate salary,
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> " That a Chair for a Professorship of Mineralogy and Geology should be established and that a salary should be provided corresponding with its dignity and importance under the title of Professor of Mineralogy and Geology to the County of Cornwall and that the same should be in the appointment of the Society,
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> " That the duties of the Professor shall be as follows : to conduct the Society (according to laws provided for the purpose) and to answer all domestic and foreign correspondence, to read a course of six lectures on Mineralogical Science etc. in every year at three of the towns situated in the mining districts (making a sum of eighteen lectures annually) and also to read a course of twelve lectures to pupils recommended and sent to the Towns wherein he resides, and also to analyse any unknown mineral substance that may be sent to him, and to perform any other scientific service which he may at any time be called upon by the Society to execute,
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> " That in order to raise a fund for this purpose, it be strongly recommended to the Proprietors of Copper and Tin Mines to allow the trivial charge of one Penny per ton on copper ore and one Penny per block of tin, to be retained by their agents and paid over to the Professor for the time being and it is hoped that a charge so small in itself and so widely diffused as to be unfelt by any individual will be esteemed a small price for so great a benefit."

But the mining fraternity remained impassive and unimpressed. Henry Boase, the treasurer, also rejected the whole idea on the grounds that, since " it was not a maxim of Government to patronize Science on public grounds ", the adventurers could not be expected to be more patronizing than the Government. G. C. Fox of Falmouth found he could not " recommend the imposition of the smallest burden on the mines, particularly at a time when many of them are from the low price of copper in a very critical situation ", and this was substantially true, for the value of the fine copper produced from Cornish ores (£422,426) and the Smelters' standard price per ton (£108. 10s. 0d.) in 1817 were the lowest for almost twenty years. When

copies of the resolutions were sent to Lord De Dunstanville, Davies Gilbert, the Cornish Members of Parliament and "noblemen connected with the mining interest", the response was lukewarm. But it is surprising that no more was heard of the project since the recession was only temporary, and the copper market began to boom again in the eighteen-twenties ; and in time it became forgotten. When the death of Paris was noted at the anniversary meeting in 1857, full justice was paid to his efforts to introduce the safety tamping bar, but no mention was made then of the professorship in mineralogy, nor at the centennial celebrations in 1914. Yet this could have proved his most important contribution to the Society, from which might have emerged a school of mines under the authority of the Society, and even perhaps in time a university college. Certainly a mining academy was in the minds of some of the members for it was in May, 1817, that John Henry Vivian communicated a paper entitled *A Sketch of the Plan of the Mining Academies of Freyburg and Schemnitz* that might help the Council in its plans " to establish a mining academy in Cornwall and a Professor's Chair ". Paris seems to have been furious and according to a letter from Henry Boase to Davies Gilbert dated the 28th May, 1817 (British Museum Add. Mss. 29281, ff. 109) threatened to resign if his scheme was rejected. Coinciding as it did with difficulties about new premises, Boase talked of the crisis in terms of " the removal if not the extinction of the Society ". Three months later Paris did resign and departed for London, no doubt mollified by the golden handshake of a " piece of plate " worth one hundred and fifty guineas and the thanks of the Society " for originating the plan and promoting the institution of the Royal Geological Society, which renders our Home the School of Science and our native riches increasing sources of prosperity ". But he was a disappointed man for he had failed to forge the teaching links between the Society and the mining industry. Over ten years later, in 1830, we find him revisiting Penzance and the Society, and depositing ten guineas to be laid out on a medal to the writer of the " best practical communication on Mining ". Perhaps there was a failing of a personal kind, for he was more outspoken and critical than the Cornish liked, and particularly when he dared to puncture the social reputation of the idol of Penzance, Davy, in a biography which brought down upon his head all the fire and anger of his brother John Davy.

Yet the ideas of Paris persisted. Everyone believed in a school of mines, but no one seemed to know how to realize it. Paris' successor, Dr. John Forbes, was a naval surgeon with a pension, and knew next to nothing about geology, but he was willing to learn, and only wanted some remuneration : " Being a single man, and possessing a sort of independency in my half-pay, I am less apprehensive of failure than I otherwise would be ; yet, considering the uncertainty of medical practice, particularly in a place of no very great extent (Penzance), I cannot help regarding even a very small and permanent secure income as a very practical object ". (British Museum Add. Mss. 29281, ff. 118 and 119). Forbes was a valuable acquisition, " and the permanency of the Institution is no longer hypothetical ", remarked Henry Boase (ibid. ff. 161), but he stayed only five years and left for Chichester, ultimately to be knighted in 1853 as Physician to the Royal Household. There seems to have been some loss of

power during these five years, the Report of the Council for 1820 complaining of " a great arrears of subscriptions ", and that " the progress of the Society during last year has perhaps been less conspicuous than on some former occasions ". In 1826 the admission was : " The Council regret its failure, since the hope of a speedy removal of a national reproach has been thereby postponed. But they will never yet despair of the continual accomplishment of a measure, first suggested by this Institution, and which it has never ceased to recommend ". When Queen Victoria became Patron in 1837 the same hopes were being expressed of " making our Home the School of Science ", but there was now the growing belief that " such an institution is not likely to be founded until the mining interest in general shall be convinced of its utility and necessity ".

It was Sir Charles Lemon who fanned the idea into flame when he became President in 1839, shortly after new professorships in civil and mining engineering had been established at the universities of Durham and London ; these stimulated him, it seems, into establishing his own school of mines at Truro through which he hoped to raise Cornish miners " far above their present position ". Here, at his own expense, he engaged competent lecturers, like Richard Pearce, and made a generous appeal to the mining interests that if thy would contribute one farthing a ton on all mineral raised to provide an endowment for the school, he would erect permanent buildings and in his will provide suitable financial arrangements for its future security. But again the response was slight in spite of his challenge to the Society in 1849 : " If then the germ of Geological Science still exists among us, it will have a convenient opportunity for development. If it does not exist . . . our Society will remain as a monument of former energies and former times ; and the best that man can say of it will be . . . Olim floruisse audivimus ". (It was contended by President H. J. Collins at the Centenary Dinner in 1914 that Lemon's plan failed because of sectarian influences at work, his students, for instance, being expected to attend morning chapel.) But the idea that had taken so long to germinate within the Councils of the Royal Geological Society was soon to be realised, for in 1853 the Council was reporting that the Central School of Mines and Science Applied to the Arts had expressed to the Society a desire to see a school of mines established in Cornwall as soon as possible and that funds voted by Parliament would be available for such efforts as might be made locally for its accomplishment. By now, of course, almost twenty-five years had elapsed since Paris had suggested this as the power house of the Society, and the bottom was now falling out of copper. Penzance could no longer be conceived as the centre for a school of mines, and many thought Truro, " from which, by lectures or otherwise, its influence may extend to all mining districts ". As it happened, the School of Mines was established in Camborne, but in this long overdue success a physical separation was made between the Royal Geological Society and the new institution devoted to Economic Geology, and a divorce arranged between labour and learning that was felt for many years to come.

The nineteenth century is strewn with the ghost towns of literary and scientific societies that failed to measure up to the challenge of change, and this might have

happened to the Royal Geological Society now that its connection with mining had been snapped by the realisation elsewhere of the very idea that it had originated, even though it placed its quite impressive and extensive library and collection of minerals at the disposal of the students at Camborne. Whether it would survive the criticism that it had outlived its usefulness would depend on its resilience and its power of adaptation. President Augustus Smith put his finger on the nerve of the problem in 1861 : " Geological Science is no longer what it was some years ago when you and others were engaged in filling up and settling the great landmarks of the science. The framework of the science is almost completed and what we are now doing is not so interesting . . . and this will, I believe, in great measure, account for the fact of geological sciences no longer possessing the popular interest which they formerly enjoyed ". The need to attract new members now that the old brigade had died off was matched by the equally pressing problem of finding a permanent home to house its ever growing collection. Discussion on this had first been raised in 1850, " yet here we are in September, 1861 ", said August Smith, " a year longer than the siege of Troy lasted and still we are without a permanent building ", so that the 6,000 fossils belonging to the Devonian rocks, the 200 fossils belonging to the Carboniferous rocks, and a drawer full of Silurian fossils could not be examined because there was no room for arranging them.

Ever since its formation the Society had been moving its tents across the cultural grasslands of West Cornwall. At the Union Hotel there had been monthly meetings, on the first Friday starting at six o'clock in the evening, but " the President shall quit the chair at nine o'clock ", ran one of the early rules. But there was a noisy theatre nearby so with a membership of almost a hundred they moved across the road in Chapel Street to the Penzance Dispensary where they had to make do with mid-day meetings on Mondays, Wednesdays or Fridays from 11.00 a.m. to 2.00 p.m. So inconvenient did this prove that on the 15th October, 1815, it was resolved that " the first Floor of the House in the Market Place formerly occupied by Mrs. Kevill be taken for the use of the Society at the annual rent of Thirty Guineas ". Three years later, the owner of the house, one Captain Commins, a member of the Society, tried to raise the rent, so the Society accepted the offer of two other members, Edward Hamilton and Robert Richards, to build adequate apartments in some houses they were erecting in North Parade, to include a museum thirty feet long, twenty feet wide and eighteen feet high, which they could have for the same rent they were paying Commins. North Parade, where there was ample room for the exhibits and the library, and even for the books of the Penzance Library, founded in 1818, was the headquarters for the next fifty years, but in 1841 pressure on space was again being recorded, and it was seriously being suggested that the Society needed a really large building. Since the cost was well outside the range of its purse it was proposed that, in co-operation with the Penzance Library, the Natural History Society, and the Savings Bank, a building should be erected to which the Royal Geological Society was prepared to contribute £1,000. In 1844, during the severe recession in mining and agriculture, there was a joint meeting of the Council and the Saving Bank, at which

it was agreed to buy a plot of land attached to the Western Hotel on a ninty-nine years' lease at an annual ground rent of £12. But there were unexpected legal difficulties — savings banks had to be built on freehold land and to possess their own premises in case they should have to be sold to realise assets — and the scheme had to be abandoned. Over ten years went by, and the only progress was the sum of £30 that the Society put aside every year in the Building Fund. By 1858 the position was desperate, for Hamilton, the Society's landlord, gave them notice to quit the premises in North Parade, or pay more rent. For a time there was argument over two sites, one in Penrose Terrace, and the other near the railway station, the latter much favoured by Augustus Smith for, as the Council Report of 1861 observed, " we know how often our proceedings are protracted until the moment of starting and how often gentlemen are hurried to catch the train ". But he was in a minority, complained from his home at Tresco Abbey that he rarely met " with that ready and unanimous support " he expected, and threatened to resign. He had every reason to be testy, for subscriptions were falling behind as the years ticked by, and Sir Charles Lemon could not be expected to last for ever to subscribe the £300 he had promised as soon as a suitable site had been agreed upon.

However, another scheme was afoot that was to place the Society in the imposing granite building they now occupy. According to the Council Report of 1861, T. S. Bolitho, one of its members, had bought glebe land which he was willing to sell to the Penzance Town Council, who would then erect on it a building sufficiently large to accommodate its own offices, public rooms, and a west wing for the use of the Society for the outright purchase price of about £230. The Society's Council approved, but the President, Augustus Smith, from his sea-girt retreat in the Isles of Scilly, objected to the high price of the land which he calculated would work out at about £1,800 an acre, and doubted whether in the long run the Society would benefit from having its apartments in the same building as the offices of the Town Council. However, he consented to reign for another year, the design of the building was decided upon, and Miss Elizabeth Carne donated the land, at a cost of £200, for the Museum, in memory of her father, Joseph Carne, one of the founders of the Society. When Smith retired in September, 1863, the relations between the statutory and the voluntary body were working well, and in April, 1864, three foundation stones were laid, that of the Town Hall by the Mayor, R. A. G. Davies ; that of the Public Buildings by the High Sheriff of Cornwall, D. Perry Le Grice; and that of the "Geological Hall " by the new President, Charles Fox of Falmouth. Classical scholar of wit and grace rather than a geologist — " Geologists trifle with time ", he said, " as the Chancellor plays with millions in the Exchequer "— he remarked that this was probably the first occasion in the United Kingdom that three foundation stones had been laid for one " harmonious " building on one and the same occasion, surely a living confirmation of the old adage, " Tria juncta in uno " which, as far as the Cornish were concerned, meant just " One and All ".

The buildings were to take about three years to complete, and were to be a financial liability from the start. A Council minute of the 28th of March, 1864,

estimated that the costs to be borne by the Society would amount to £2,500, but when they were officially opened with the usual ceremonies and a public dinner in the " Geological Hall " on the 10th September, 1867, there was a deficit on the West Wing of £738, rather more than the ageing membership could bear, and already in his presidential address of the year before, Charles Fox had felt bound to ask younger men to come to the aid of the Society : " Let us not be content with the prestige of the past, nor allow the Society to be looked on as a vacant cranium, entombed in a splendid mausoleum, but with no trace of its early and vigorous life ". In August, 1866, there were demands from the contractors for £400, and the bewildered treasurer was left on his own " to make arrangements for obtaining the necessary amount " ; D. P. Le Grice, two of the Bolithos, and the Rev. M. N. Peters dipped into their pockets, but the Society had to forego an essential to any museum, a " warming apparatus ", which it still lacks.

Not even the elegant eloquence of Charles Fox could calm the rising waters of financial worry. At the first anniversary meeting in the new rooms he complimented the Society on having a permanent home for the first time in fifty-four years, a home of " perfect convenience, clothed in unaffected grace ", with ample space for the library and the exhibits and " the convenient laboratories for the chemical analysis of rocks and metalliferous compounds ", and hoped " that not only might the Society continue to flourish, but that whether it be for the enjoyment of lectures, the solution of some problem in science, or the contemplation of some masterpiece of art, we shall learn to abandon prejudices, to appreciate each other's merits, and to foster in ourselves and in our neighbours the love of all that is good, beautiful and true ". But within a year the Council, on the 11th June, 1868, was having to recommend that they should raise a loan of £1,000 by mortgaging their new premises, and let out for rent whatever rooms they were not immediately using. But where to raise the money ? First they appealed to Penzance Town Council, in a letter dated the 13th of November, 1868, in which they outlined their policy and their problems, stressing that " the time is arrived in which they are in duty bound to make a strenuous and persevering effort to enlarge the usefulness of the Geological Society and to make it . . . a source of advantage and credit not only to this town and neighbourhood but to the country at large ". This they were unable to do because the building had involved a larger expenditure than they had anticipated, first because of " the large proportions of the Public Buildings ", and secondly because of " the granite front which was adopted in deference to an almost universal opinion ". The result was that they had no money now for fitting out the lower room for a display of their unique fossil collection. They then asked the Town Council for a grant on the grounds that they were fulfilling an educational need in the town, describing the Society as " a school of instruction ", providing courses of lectures in Geology, though it was admitted that " their ill-success showed that the effort was not of the kind that was required ". It was true that lectures had been arranged for the Miners' Association, but these were never really successful as far as attendances went, and the Council of the Society were of the opinion that " regular class teaching embracing

a complete course on the Elements of Geology would have been more suitable to the need and have been more likely to be attractive", and especially if the laboratory had been properly equipped and instruction offered at the same time in chemical analysis. It is not surprising perhaps, in view of these admissions, that the Town Council did not make the grant, though the Mayor made strenuous efforts to canvas subscribers both in and outside Penzance.

Their deliverer was again Elizabeth Carne who, in the Spring of 1869, made two attractive offers. First she guaranteed to construct on the Society's premises a museum specifically to house her father's mineral collection. Details were worked out at a Council meeting of the 22nd of March — that she should have a plot of land behind the main building in perpetual tenancy on payment of a nominal ground rent, that the museum should belong to her family, and that the Society should have the right of entrance at all times. Furthermore, she offered to pay £500 towards the cancellation of the main debt if the Society would raise another £500 by mortgaging the building, pay her a life annuity of £20, and would not mortgage themselves for more than the £500 until she was dead and the annuity ceased. Actually there was no need for the mortgage since enough money had been raised by public subscriptions, so that all the Society now had to find was the £20 for the annuity, and this was most conveniently done by setting aside the reliable annual contribution of the Prince of Wales, with royal permission of course. But this was not quite the end of their difficulties. Elizabeth Carne now abandoned her idea of building the museum, doubtless because she felt that the existing premises were already too large for the resources of the Society, and suggested that she became the tenant of " the lower front room ", where she could house the Carne Collection ; she also promised to make some improvements like fitting it with galleries, and installing a heating system, provided the lease could be for her family for ninety-nine years, and that she could close the room for one day a week for private viewing. But a truncated Council of the 27th December, 1869, killed the plan because they thought the public might be excluded from the lower room for almost a century, and so lost a valuable tenant who probably believed she could manage the physical affairs of the Society better than the Council. After all she had donated land, money, minerals, and books, including a unique complete set of the Philosophical Transactions of the Royal Society, and was now offering to equip a room that the Society could not afford to do themselves. They could not even provide the cash to warm the place ; damp was already appearing within three years, and fires were ordered to be lit twice a week.

So the Society found themselves with premises so large and spacious that they could not really afford to maintain them adequately. In his retiring speech of 1871, the President, Hugh Seymour Tremenheere, observed that to date the Society had spent £3,750 on its rooms, but the truth was that " two-thirds of it are at present unoccupied ". No man was better qualified to find a solution to their problems. For years he had been an Inspector of Schools, a member of the Committee of the Council for Education, had prepared a survey of schools in Cornwall, and was at the very centre of all those ideas that had brought in the Education Act of 1870 to make

elementary education in England compulsory, inevitable and desirable. He now saw the Society in its historic rôle as the spearhead of the new education of technology, even as Paris had seen the link with mining some fifty years before. The Society, of course, had developed a lecture tradition of a kind, first for the benefit of its own members, and then for the public in order to attract new members. But he now suggested that the Society should deliberately and systematically promote, not isolated lectures, but public courses of instruction in mineralogy, geology, practical chemistry, the mechanical sciences, trigonometry and natural philosophy. For such courses the services of a first-class teacher would be required, and no doubt one could be found, said the President, if he were offered " commodious living rooms " next to his laboratory, and a tempting salary, which would be perfectly feasible, since it could be made up of the fees of students, " payment by results " if they passed the examinations set by the Science and Arts Department of the Committee of Education, and a grant from the Penzance Town Council, which they could raise by levying a special rate of one penny in the pound under powers given to them by the Free Libraries and Museum Act, entitling them to make grants to scientific institutions. There is little doubt that Tremenheere saw the Society as becoming a college for the teaching of the physical sciences : " there is a very considerable movement in favour of a national university for industry and technical training, and Penzance, which has been called ' the intellectual capital of Cornwall ' should not lag behind ". And he quoted the fact that in 1871, within six months, £27,000 had been raised in Northumberland and Durham to establish a college of physical sciences at Newcastle-on-Tyne.

It was perhaps too optimistic to expect that so large a sum could ever be found in Cornwall for the unpalatable truth was that the epicentre of the industrial revolution had moved from Cornwall to the North of England. Smoky Cornwall was already becoming sunny Cornwall as one after another the mines closed, their giant beam engines became silent and the young men took to the boats to seek a new life in Michigan, Colorado, Utah, Idaho, California and Arizona, taking with them the best years of their lives and their mining skills, to build a new industry in the United States and to give their children there educational opportunities which were lacking in Cornwall and England. Moreover the Society did not seem to have the energy and the drive to plan action on the imaginative lines suggested by Tremenheere for " the ladies greatly preponderated in the Assembly ", sadly commented the Cornish Telegraph of the 8th of November, 1871. It was a pity too that Tremenheere thought he should resign in favour of Warington W. Smyth, an experienced geologist and engineer responsible for all the mining interests on the Duchy property, who hoped to bring about an amalgamation of the Society and the Miners' Association for the promotion of " scientific education ". Without an educator of vision, as Tremenheere was, little progress was likely to be made. A start began with classes but though they are usually described as " successful ", between 1874 and 1875 they could have made but little impact, for there were only seven students. Some advance was made with the Miners' Association when it was permitted to hold its annual general meet-

ing in the rooms of the Society, and there was some vague talk about amalgamating with the other scientific societies in Cornwall, but twenty years were to elapse before agreement could be reached on an annual joint meeting.

Warington Smyth's presidential address at the anniversary meeting of 1876 gave the impression that the Society was still youthful and vigorous ; " The number who this day attend our meeting, the undiminished fulness of our list of members and the considerable throng of visitors to the gratuitious exhibition of your collection warrant my asserting that the capital of old Bolerium is determined to maintain her place amid those who either by actual labour or by intelligent appreciation do their best to foster intellectual culture ". The continuing success of the classes in chemistry, geology and mineralogy was reported, and for the first time it is being noticed that they are being organised by the Miners' Association. An annual prize of £5 was being offered for the best essay on any mine or mining district in Cornwall. Attempts were being made to ensure that the anniversary meeting would be more attractive by introducing an evening's conversazione to give the place an " unwonted air of comfort . . . with drawing room furniture of couches, gipsy-tables and jardiniers ". But the curator was complaining that it was time that his office was salaried, dry rot was appearing in the basement, and in 1880 attendance at the anniversary meeting was so poor again, in spite of the social experiments four years before, that a proposal was passed " that this meeting desires to refer to Council, with powers to act, the consideration of the question whether any change for the better can be introduced into the proceedings of the Annual Meeting ". And Warington Smyth was so dispirited in 1881 that his address was no more than a delightfully pleasant but useless talk about his recent visit to France.

Leonard Courtney seems to have been more dynamic and challenging, as well he might for at the first Council on the 7th February, 1882, " with the exception of the Secretary there was no attendance ", and when the Society was approached by the Mining Institute of Cornwall to raise a memorial in honour of Richard Trevithick on the occasion of the fiftieth anniversary of his death, it regretted that it could do no more than " lend the machinery of the Society ". (In fact Trevithick had to wait until 1932.) At the anniversary meeting of 1882 Courtney admitted that he was no geologist and had been elected President merely because of his associations with Penzance, but that, he said, would not prevent him from offering some observations about Geology from the angle of a man of liberal education who saw the need in the modern world for a philosophy that Geology gave. This was an age, he asserted, of great advances in science, but could it also be said that " the ragged edge of pauperism and crime which surrounded the edge of society had in any sense disappeared ?" Geology should elevate the mind in considerations of time, space and life, and Geology showed that they were in the midst of a process of life that had not been arrested and would go on indefinitely. Thus Geology affected the whole conception of the history of Man, revealing the slow processes by which he became what he was even as the unfolding and rolling back of his story was a slow process of investigation. The lessons of Geology for the politician were clear : " Work on,

however slow the accretion. By slow accretion and constant action the changes which now appear utopian may become real and numbered among the accomplished triumphs of humanity ".

The argument of the " inevitability of gradualism " was perhaps too thin for those who laboured in the slums of social reform, but it gave the Society a sense of educational purpose and prevented it from turning itself into a social club, as the Literary and Scientific Society at St. Just was doing where, in an attempt to attract new members, the lecture hall became a billiard saloon. Penzance still hammered away at its science lectures, and in 1882 organised a Scientific and Industrial Exhibition in St. John's Hall to raise funds for their promotion. In 1889 they began to let their rooms to the local Natural History and Antiquarian Society and the recently formed Camera Club, in 1890 they donated money for the building of the new Science School in Morrab Road that may be said to have arisen from their own pioneer work, and in 1891 a resolution was passed " to render any assistance in their power in developing Technical Education in connection with the mining interests in the County ".

Such projects were wholly admirable, for there is little doubt that as the century came to a close their reserves of energy were low, though a welcome legacy was a bequest in 1889 of £1,500 from the Rev. James Carne, vicar of Merther, for " the establishment, permanent support and endowment of a Curatorship ". For instance, they failed to grasp the opportunities of University Extension Lectures provided by the University of Oxford on the grounds that Geology was not a suitable subject, and instead sought survival in some kind of loose association with the other Cornish societies almost as old as itself, the Royal Institution, founded in 1818 at Truro, the Royal Cornwall Polytechnic Society, founded in 1833 at Falmouth, and the Mining Institute and Association at Redruth, founded in 1859. It was Lord St. Levan who first made this suggestion in his presidential address in 1891, coupling it with the arresting idea that the four societies should amalgamate to form the Royal Society of Cornwall with a peripatetic annual general meeting. The Cornish Times of the 22nd of October, 1891, however pointed out that the truth was that the Geological Society was in effect asking to be rescued from oblivion by its three more powerful brothers since the annual meetings at Penzance " have of late years gone from bad to worse in the matter of dullness and absence of public interest . . . and for some years past it has been in a perfectly lethargic condition ". The report concluded : " All that it does by way of justifying its existence is to hold an annual meeting, which is generally attended by about a score of ladies and gentlemen who dutifully listen to the reading of somewhat disconnected portions of papers which are scarcely understood by anyone present, not excepting the President, the Secretary and the rest of the officials ".

Was the Society dying the slow lingering death of old age, its body enfeebled and spare, and its mind completely out of touch with the world around ? Superficially it seemed so. There had been one hundred and thirty-six members in 1815, but in 1891 only sixty-six, and so the ever present problem was one of financial

resources to meet the costs of maintaining their vast premises ; and in 1891 they let their two front rooms for an annual rent of £10 to the Penzance Corporation, provided that they were consulted about structural alterations, and that the rooms were restored to their former condition " if required ", for they had no use for them themselves. Perhaps Augustus Smith was right after all. No longer do they retire for dinner to the Union Hotel after the anniversary meeting but to the fossil museum " where tea and coffee are served ". The male members decrease and the females increase, and more hats and fewer watch chains are seen at these meetings until in 1893 a President is constrained to implore the women to become geologists. As if in reply, the monthly lectures are started up again by " prominent geologists " but once again the attendances are " rather small ". At the anniversary meeting of 1895, President Thomas Roxburgh Polwhele remarks that interest in the Society is not what it should be " as the lack of attendance at the annual meeting and the reduced number of subscribers clearly show. Popular lectures had been tried but proved to be a failure, only eight persons present at the last one. It was time therefore to try to educate the county on the subject of Geology in some other way ".

But what other way ? Falling off of the attendances, of course, was no new problem either to the Society or to any other society. In 1816, a vintage year otherwise, the Secretary had minuted one quarterly meeting of the Council : " No attendance. Let it be recorded to the disgrace of the residents of Penzance that four members of the Society came from Truro and its vicinity for the purpose of attending this meeting and found, with the exception of the Secretary and the Assistant Secretary, and two others, no others resident in the vicinity ". It was therefore seriously considered that Council members who absented themselves from two successive meetings without notifying the Secretary should be fined five shillings a time. But in the 1890's the problem was that of the slow erosion of interest because the Society had lost its sense of direction. Polwhere in 1896 blamed the Society for failing to link itself with the School of Mines at Camborne ; " Had the mining school been at Penzance or the museum at Camborne, an amalgamation might have been effected to the advantage of both, but he feared they were too far apart to make that possible. Amalgamation, however, might be brought about by the pupils at Camborne contributing to the cost of getting down a good geological lecturer ". The distance between Penzance and Camborne was less than thirty miles, but it might as well have been three hundred. Several times the faithful took the train to Camborne to hold the anniversary meetings in the School of Mines, but the attendance was no better. In more recent times much more significant progress has been possible since lecturers at the School of Mines have been the officers of the Society, a fact which would have warmed the heart of Paris, but the Museum and the School are still where they were fifty years ago.

The truth was, at the turn of the century, that the Society was declining in numbers because of its very historic associations with Economic Geology. As one by one the mines shut down all over Cornwall and the more enterprising of the miners emigrated to America, Australia and South Africa, the reason d'etre of the Society

seemed to disappear too, and members found it increasingly difficult to rediscover a new place for themselves in the changing pattern of Cornish culture. The dislocation in social life was more serious than some contemporaries imagined, producing a lethargy and a tiredness that visitors from abroad sometimes mistook for laziness. One of Cornwall's most distinguished " exiles ", Dr. Richard Pearce of Redruth and Denver, Colorado, had been, before he emigrated, a pioneer in the teaching of mining science in local schools at Pool, Penzance and St. Just, from which had emerged the Miners' Association, founded by Robert Hunt. After forty years in the United States, he came back to Cornwall in 1902, was President of the Society in 1904, and was highly critical of the situation he found in mining, according to the Cornish Telegraph: " He was sorry to find old production mines not working. He had thought that with cheap labour and modern mining appliances there would have been applied not only talent, but capital, to the investigation of those places where mineral was produced at a profit under very disadvantageous circumstances fifty or a hundred years ago. He was sure if these areas were transferred to the other side of the Atlantic there would be very soon a large number of prospectors busily at work on them. He feared there was a lack of energy on the part of the Cornish people ". Some of that energy, of course, had been drained off to America and elsewhere, and the Society, like other institutions of its kind, was being hard pressed to find new blood. Yet it continued to show a remarkable resilience, patience and stamina as it carried out Lord St. Levan's plan of co-operating with the other Cornish societies. The first joint meeting was held at Truro in 1893 on the occasion of the Cornish Fisheries Exhibition, and the second at Penzance when an important paper was read by F. J. Bowles of Falmouth, entitled *Recent Developments in Technical Education.* In this he argued that just as compulsory elementary education had been realised through its early encouragement by societies like themselves, voluntary bodies existing without any public grants, so too technical education would soon become a State responsibility, and the Society could rediscover its mission by allying itself with this movement to ensure that it developed along the right lines. It does not seem clear what was the precise nature of the lead that the Society was expected to give, but at least it continued with its joint meetings as new variations on the original theme. In July, 1895, the third meeting was at Redruth, organised by the Mining Association of Cornwall, when visits were made to Wheal Agar, East Pool and Carn Brea mines and papers were read on the art of rock drilling in the dining room at Carn Brea mine counting house. There was another in the autumn of 1898 at Truro, where papers were read on *The Camps in Cornwall, Shafts and Shaft-sinking, The Men who made the Cornish Mines*, and *The Gold Industry of the Urals*, and some discussion took place whether there should be a Cornish contribution to the Greater Britain Exhibition to be held at Earl's Court in 1899. Thus the connection between Geology and mining was being maintained, but after two more meetings, one at Penzance in 1899, and the other at Falmouth in 1900 on the occasion of the sixty-seventh Exhibition of the Royal Cornwall Polytechnic Society, the scheme appears to have been abandoned.

The crest of the century had been cleared, and the Society was now moving towards its own centenary and this fact alone gave it a new confidence and optimism. Some stimulation had come from the bequest of William Bolitho in 1894 of £500 to provide annually " a gold or richly silver medal for a member of the Society, whether ordinary, honorary or associate, whose labours, attainments or discoveries in geological or mineralogical science are considered the most deserving ", and in due course a design was decided upon. The obverse side depicted a portrait of the donor and the years of his birth and death, the reverse the arms of Cornwall surrounded by mining implements and Davy's safety lamp, with a crown above, the plumes of the Duke of Cornwall and the Prince of Wales on either side, the arms of Penzance below, and the name of the Royal Geological Society encircling the whole. The Bolitho medal, like the Transactions, richly stamped the Society with a national and international reputation, and carried it on a tide of scientific excellence towards its centenary as the winners came to Penzance from near and far to receive their awards ; Robert Etheridge, F.R.S., the Assistant Keeper in the Geological section of the British Museum ; Howard Fox of Falmouth ; J. H. Collins, at one time analyst for the Rio Tinto mines in Spain, and founder of the Mineralogical Society of Great Britain, Fellow of the Geological Society of London and President of its relation in Penzance ; Fortescue William Millet of Marazion ; Dr. Le Neve Foster, F.R.S., Inspector of Mines for Devon and Cornwall, once secretary of the Society and soon to be its President, Dr. Richard Pearce of Redruth and Denver, and the most distinguished of the " amateurs " Thomas Clark, quarryman, stonecutter and marble mason.

The Society entered upon its centennial celebrations on the 3rd and 4th of July, 1914, to the accompaniment of pistol shots in the Balkans, just as it had been born in a wave of hysteria and fear as Napoleon returned from Elba to claim his tottering empire, and it received the congratulations of the Penzance Corporation, the other Cornish scientific societies, the London Geological Society, the Chemical Society and the Institute of Mining and Metallurgy. Then as now, when it approaches the halfway mark to its second century, it was thought right to reflect on the sources of its origin and to consider the policies that might shape its future. Favoured as we are in 1964 with more hindsight that the celebrants of 1914, a re-reading of the reports and minutes of the Society makes one wonder and marvel that the Society should have lived so long. It was fortunate to have been founded in propitious times when Geology was a new science, when Cornwall was still one of the hubs of the complex of wheels and levers that gave power to the Industrial Revolution, and when the Cornish business executives stood close to the market of ideas in London. Since 1914 the rich patron has disappeared and so, in an age of heavy taxation and a continual rising cost of living, it has become increasingly difficult to discover new sources of financial support in a country that is strewn with the wreckage of steam engines and deserted chimney stacks, and whose population shrank with its crumbling mine shafts. The theory that the State must tax heavily because it carries the responsibility of ensuring the founding and the maintaining of social, educational and cultural

services apparently has never been applied to the Royal Geological Society of Cornwall which has survived without public grants of any kind, in spite of the lead that it has often given in the promotion of educational projects. But institutions, like trees, only live or die according to the care and attention they are given by people who believe in them, and their founding and planting, and later their maintenance, are invariably acts of faith. The Royal Geological Society has always been fortunate in its Presidents to mark out the boundaries of this faith for, as in the Royal Society, at the anniversary meetings they really made an attempt to survey the state of geological knowledge and to trace and shape its pattern in the world as they saw it. For instance, in 1866 we have the spectacle of Charles Fox (1863-1868) ranging over the latest discoveries in Bohemia, Syracuse (New York), the Isle of Skye, Spain, Syria, Turkey, Norway, Moscow, Ireland and Devon — he was a hardened traveller himself — drawing attention to the then giants of geology like Murchison and Lyell, even putting Darwin in his place, and then proceeding to vindicate the ways of God to men, himself preferring design to mere continuity or selection since " the earth, O Lord, is full of thy riches ". Augustus Smith (1858-63), educated at Harrow and Christchurch, has been described in the minutes of 1872 as " a man of eloquence who exhorted the rising generation of Cornish gentry to emulate the intellectual activity of their fathers ". Sir Warington Smyth (twice President, 1871-9 and 1883-90) educated at Westminster and Trinity College, Cambridge, was the chief Mineral Inspector of the Crown, and was a world authority on the minerals of Germany, Austria, Hungary, and European Turkey. And their descendants have been equally distinguished in their different ways ; sometimes geologists, mining engineers and men of liberal education, and sometimes schoolmasters, schoolmistresses and lecturers, but all deriving from Davies Gilbert and Sir Charles Lemon.

If the Presidents gave leadership and intellectual patronage, it was the members who laid down the firm tradition of enquiry into Geology that found its way into the Transactions and then into the libraries of similar institutions all over the academic world ; Dr. Henry Boase, Assay Master of the Duchy, and compiler of the first geological map of Cornwall ; W. J. Henwood, assayer in Brazil and Upper India, a contributer to the Transactions for over fifty years, and famous for his *Survey of the Mines of Cornwall ;* John Samuel Enys, William Copeland Borlase, A. P. Vivian, author of *Wanderings in the Western Land,* Richard Quiller Couch and hundreds of others whose names appear in the Transactions over the years to give the Society the international reputation it has always maintained. Scarcely less important were the men who lent their patronage from afar as honorary members, all of them distinguished geologists ; the Rev. William Buckland, Professor of Mineralogy at Oxford ; Sir Henry P. De La Beche, appointed in 1835 to prepare a geological map of Cornwall ; Charles Koenig, chief mineralogist at the British Museum ; Sir Charles Lyell, Professor of Geology at King's College, London ; Sir Roderick Impey Murchison ; the Rev. William Whewell of Cambridge ; the Rev. Adam Sedgwick, the Woodwardian Professor of Geology at Cambridge ; William MacClure, President of the Academy of Natural Sciences of Philadelphia ; and J. A. L. Elie de Beaumont, President of the Geological Society of France and Inspector-General of

Mines, who, drawing on the material in the early Transactions of the Society, wrote one of the most authoritative books on Cornish mining, his *Voyage Metallurgique en Angleterre*. It was through men like these that the reputation of the Society grew in its formative years, and its library and museum developed their gargantuan appetites for space. Is it not astonishing that at the most westerly tip of England, Scotland and Wales this Society should possess a complete set of the *Philosophical Transactions of the Royal Society ?*

Institutions are living organisms which, to survive, have to adapt themselves to changing conditions by a natural process of selection. In one sense the original aims of the Society have never changed for at its first meeting it was stated that it was formed " for cultivating and diffusing the knowledge of geology and mineralogy ". This it continues to do through lectures, teaching, the publishing of its Transactions, and its field studies. But the Society also felt that it needed to operate within a wider context of studies if it was to function educationally and socially in the community and to take root among people. So the first report of the Council specifies that it is also concerned with " the discovery of new facts to enrich science and the application tion of science to enrich Art ". We do not find in the reports of the Society any definition of " Art " but to the founders it approximated to a quotation that Charles Val le Grice used in one of the very first meetings :

" Amid the starry hosts that nightly shine
And the thick darkness of the deepening mine
We hear the Voice and own the Hand Divine ".

Here we may recognise a refrain from the seventeenth century that, as Thomas Browne put it in his *Religio Medici*, " All things are artificial ; for nature is the art of God ". And in the search for an understanding of God was clearly involved the comprehension of nature and natural man, Art was the mirror that told them something of the image of man and his environment, and Geology was the body of knowledge that could break through the barriers of time. A question that arises is whether these aims of the Society have any validity today.

It seems clear that the members of the Society from the beginning experienced a feeling for the unity of knowledge in an age of increasing specialisation. One view is that the fragmentation of knowledge really began with the disintegration of the Middle Ages when society, religion and the arts expressed a common set of standards and values, and that this process has never stopped, leaving us to face the phenomenon of the " two cultures ". Now the Royal Geological Society, though specialist in that it set out to explore the frontiers of one science and its application to one industry, never really forgot its other responsibility of concerning itself with Education which, in a sense, is the art of living. Today the layman, eager to understand the nature of scientific processes and how the mind of the scientist works, is stupified and perplexed before the text books of physics and chemistry that talk a language that he cannot understand and demand equipment that he can never acquire, for gone are the days when a Davy or a Faraday could make do with the simplest of gadgets in a basement or an attic. But with Geology the student, armed

with only a note-book and a hammer, can go a long way to discover, through the soles of his boots, that the present is indeed the key to the past, and that through the study of geological formations he learns about the antiquity of Man. Geology is a practical, technical, philosophical and educational subject that has a special perspective on Time which intersects those of History, Archaeology, and Anthropology. As such it holds a compelling position in the general education of the young and the liberal education of the old. Indeed one of the most promising signs of the continuing strength of the Royal Geological Society of Cornwall is its younger members, some of them recruited from local schools, at work on their field excursions, a sight that would have thrilled Ayrton Paris. As yet it may be too early to claim that he made a Department of Geology for a future University of Cornwall, but at least in his case, we may agree with Emerson that " an institution is the lengthened shadow of a man ".