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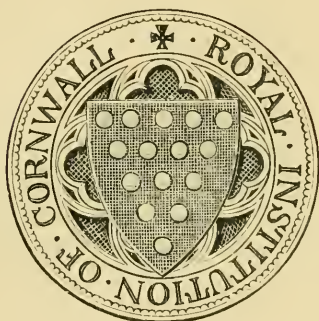
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ADDENDA ET CORRIGENDA.

Page 140. In plan opposite, for 2' 2" read 2' 3".

„ 134, note 2. This is an error. The chapel referred to in the taxation was, of course, not St. Piran's, but the dependent chapel of St. Agnes, a *capella curata*, which was severed in 1846, when it was made a perpetual curacy, and is now a titular vicarage.

In vol. XV, page 149, add *St. Cleer*. At the recent restoration traces of scroll work, with texts, were found in the spandrils of the arches of the N. and S. arcades and on the south wall, principally in sepia, yellow and brown. They were too decayed to admit of their preservation. The trunk of a 15th century alabaster figure was discovered in a piscina in the south chapel, and showed traces of gold, red and green. T. S. Lanyon, vicar.

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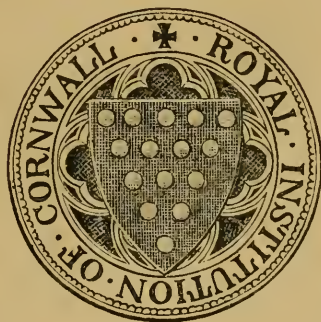
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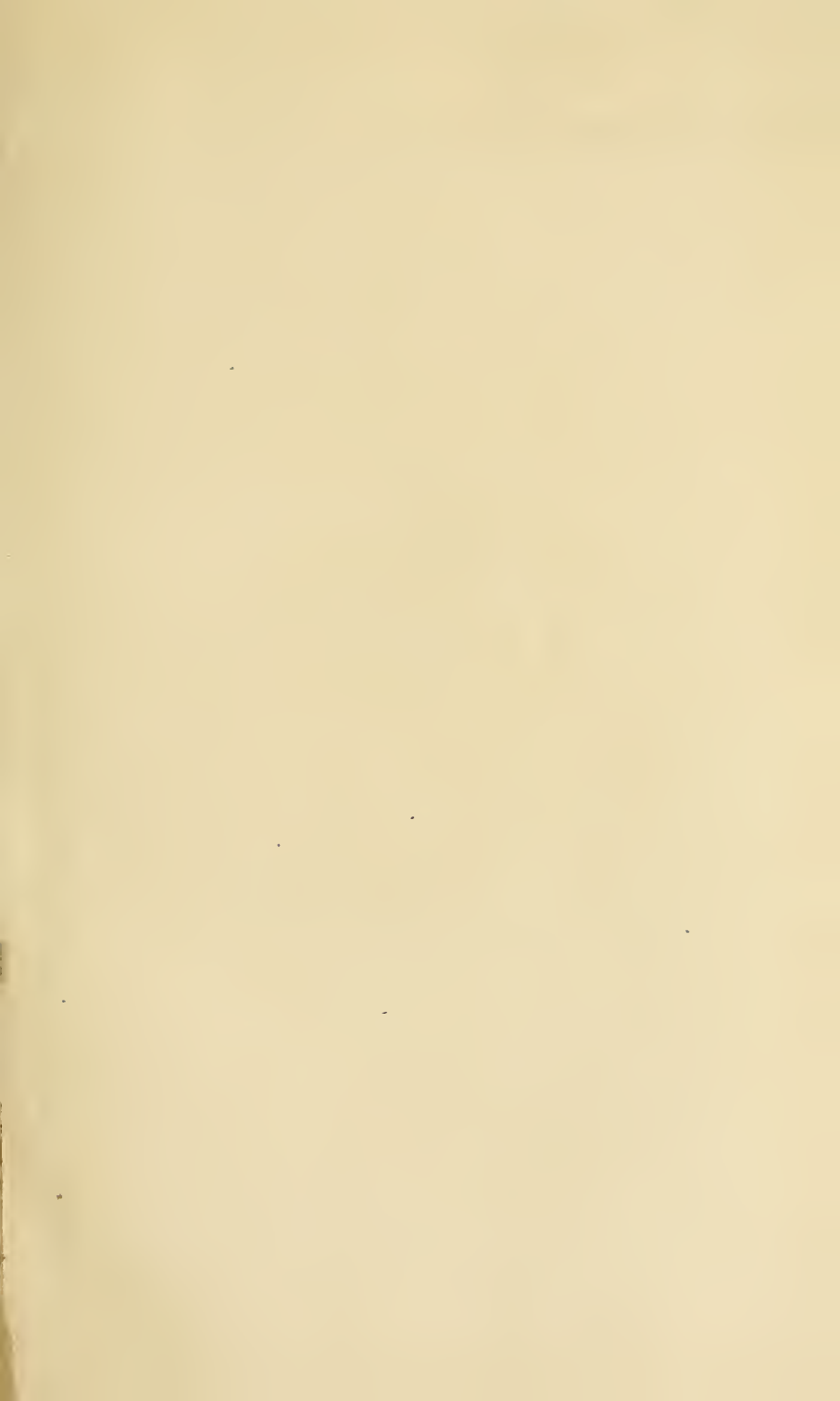
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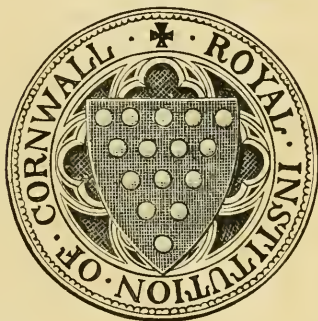
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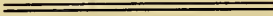
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Royal Institution of Cornwall.

—◆—
 SPRING MEETING, 1903.
 —◆—

The Spring Meeting was held on Tuesday, 26 May, 1903, when the President, Sir Robert Harvey, occupied the chair. There were also present Archdeacon Cornish, Canon Donaldson, Canon A. P. Moor, Rev. D. G. Whitley, Rev. W. R. Erskine, Rev. G. P. Chamberlain, Rev. W. E. Graves, Professor Clark, Dr. R. Pearce, Messrs. J. D. Enys, F.G.S., J. Rogers, S. Jones, W. F. Radmore, T. L. Dorrington, E. Kitto, F.R.Met.S., W. J. Clyma, A. P. Jenkin, H. E. Davison, W. A. Rollason, T. Worth, J. P. Paull, G. H. Chuleott, R. Vallentin, F.L.S., H. H. Share, A. P. Nix, H. Barrett, J. C. Daubuz, W. N. Carne, J. Barrett, H. M. Whitley, Rev. W. Iago, and Major Parkyn, F.G.S., Hon. Secs. ; and G. Penrose, curator; Mesdames Jenkin, Kitto, Rogers, Clark, Tomn, Paull, Leverton, Plunket, Misses Rogers, Tomn, and Share.

The Minutes of the last Annual Meeting were read by the Honorary Secretary, Major Parkyn, and confirmed. Letters of apology for absence were received from Rev. S. Baring-Gould, Messrs. Thurstan C. Peter, Robert Fox, Silvanus Trevail, J. H. Collins, James Osborne, F.G.S. ; Howard Fox, F.G.S. ; J. V. Kean, and Hamilton James.

The curator (Mr. Geo. Penrose) reported receipt of various gifts to the museum and library since the annual meeting in December last.

Rev. W. Iago said that the portrait of the late Philip Rashleigh, presented by Mrs. E. E. Tremayne was of special interest, in view of the fact that it was a painting beautifully executed by herself, and also because it represented the collector of the Menabilly minerals, which Mr. J. D. Enys and others had presented to the museum.

The PRESIDENT delivered an address on the Incas and other rulers of Peru. This address is printed below.

TREGEAR CAMP.

Mr. J. D. ENYS dealt with Tregear Camp, in North Cornwall, a short distance north of St. Kew-road. He said that this camp was in direct communication with another camp, and was evidently one of a large series of camps which existed throughout Cornwall. This was the first of any of the camps which had been explored. No coins had been found there, but only pottery of different ages. The exploration of the camps was badly needed, in order to give them some knowledge of their origin, their builders and their uses.

Mr. H. MICHELL WHITLEY read some notes on the aids to identification of Domesday manors, and Mr. Vallentin promised to prepare a paper on a visit he recently paid to the Isles of Scilly.

Canon DONALDSON proposed a vote of thanks to the readers of papers and to donors of gifts to the museum and library.—Dr. PEARCE seconded, and it was carried.

On the motion of Mr. DAUBUZ, seconded by Mr. A. P. NIX, the president was thanked for his services to the Institution, and in reply Sir Robert Harvey said he hoped to have the pleasure of seeing the members at Trenowth when they held their annual excursion.

THE INCAS AND OTHER RULERS OF PERU, WITH SOME
REMARKS ON THE POZO STONE.

BY SIR ROBERT HARVEY, A.M.I.C.E., M.I.M.E., &c. &c.

The fact of my having been fortunately able to present what is called the "Pozo de Almonte Stone" to our museum has, in almost a natural way, led up to my now offering you a few remarks on the ancient people who carved that stone, and on their far more interesting rulers who held sway not only around Pozo de Almonte, but for two thousand miles north and two thousand miles south of that spot. In fact the Pozo Stone forms a not inappropriate text for my remarks.

The Pozo Stone, as you are aware, is a somewhat bulky mass of limestone, covered with strange engravings which, like the ancient rock carvings to be seen among the Italian Maritime Alps, appear to have been executed by tapping with a flint point or hatchet on a relatively smooth stone surface.

For several years prior to my return from South America, I was aware of the existence in a valley some 30 miles inland from the port of Iquique of several picture-stones, the origin and meaning of which no one could tell.

The valley to which I refer lies among the hills which form the western boundary of the great rainless plain of Tamarugal in the province of Tarapacá, and in about $20^{\circ} 15'$, south latitude, and in longitude $70^{\circ} 15'$ west.

The main line of the Nitrate Railways from Iquique to Pisagua runs along the eastern slope of the valley, a few hundred yards distant from and considerably higher than the site of the picture-stones, or what *was* their site; for I regret to say that my friend the late General Manager of the railway, through what I can only call culpable negligence, allowed all or nearly all the stones to be broken up and burnt for lime by his workmen.

Happily before this iconoclastic outburst I had determined to obtain one of the stones for the Truro Museum, and so, in the year 1884, by means of tackles, rollers and inclined plane, and

with the hauling power of several labourers, this curious relic of the past was moved from its resting place of centuries, placed carefully on a railway truck, carried to Iquique, and shipped for what I trust will be its final abode.

Some people think that the proper place for antiquities is the country in which they are found; but, without going into the ethics or sentiment of the matter, I think you will agree that in the case before us to-day a Cornish museum is a fitter home for our curiosity than an unguarded valley in South America where ruthless destroyers roam unchecked.

So much for the stone itself.

The hieroglyphics on the stone have awakened considerable curiosity regarding their meaning and purpose, and have turned the thoughts of many towards the people who were patient enough to engrave them.

Our late accomplished curator has offered a most ingenious solution of the problem presented by the stone, but I do not suppose that he intended to dogmatize infallibly on a subject with regard to which I fear we must, in the present state of our knowledge, be contented to retain an open mind. And as I am not qualified to enter the lists as an original decipherer of those extraordinary figures, so neither am I justified in posing as the supporter of any interpretation already suggested by others.

The hieroglyphics of Egypt were, we know, mainly interpreted through the discovery of the Rosetta stone (now in the British Museum), which displayed a long and rather dull story in hieroglyphs with its translation at foot into the Demotic and Greek languages. This proved a real stepping stone to the complete knowledge of the hieroglyphic language of that ancient country, and served to establish the chronology of Egypt.

In Peru, however, we can hardly hope for any similar discovery, for, though the early Peruvians were, relatively speaking, highly civilised before the Christian era, they do not at any time appear to have enjoyed the possession of an alphabet, and in fact, they seem to have drifted from the irksome process of carving their thoughts in stone to a less laborious though possibly more complicated method of recording them by tying

knots in strings, which they called "quipus." It is of course possible that the removal of our ignorance as to the meaning of these mysterious signs might merely result in the loss of that romance which so often clings round the unknown. To judge from analogous inscriptions found in Egypt, the subject of hieroglyphic records was mainly one of a very unpleasant nature, and which is still in modern times extremely repellent to the average man—namely, rates and taxes. True it is that some bore witness to the dates of the birth and death of sundry kings, many, doubtless, great warriors and statesmen in their day, but the majority of whom do not appear to have soared above mediocrity. I have little fear, and less desire, that the tone of these remarks will dishearten any student of Egyptian history; I merely confess that my own personal attempts to gain some knowledge of the subject have been discouraged, and I have been thus led to indulge in the idle feeling that perhaps after all we do not lose very much by our inability to interpret the mysteries of the Pozo stone.

With regard to the people who carved those figures, in the land which is now the province of Tarapacá, little more is known than about the carvings themselves. It is recorded that some southern tribes existed, as far south as the present site of Iquique, under the name of Chinchas; they were conquered by the central power established at Cuzco as early as 200 B.C. However, they do not appear to have occupied any prominent place in the history of the nation—either at that remote period or at any subsequent one. Though hieroglyphics gave way to the "quipus" in all the northern and more civilised districts before the Christian era, it is quite possible that the simple-minded Chinchas may have preserved their old-fashioned methods and continued to carve their thoughts, record their taxes or objections to paying them, on stones, in the primitive hieroglyphic language, during many centuries after they became subjects of the Inca. It is therefore difficult to assign any precise date to the stone.

Though our knowledge of the early history of Tarapacá is thus vague and scanty, the general history of the country of which it has formed a part during many centuries, until its conquest by Chile in 1879, is extremely interesting. You may

therefore probably prefer to listen to a brief resumé of the history of that wonderful country than to a further straining after the meaning of the hieroglyphics, or further enquiring into the early customs of Tarapacá, about the ancient conditions of which district so little that is positive is known.

It is a difficult matter to compress the history of Peru into the compass of a short paper, and I must apologize for the boldness of the attempt. Some of my hearers may have read Prescott's work, which practically contains all that is worth knowing upon the subject. I trust these will listen to my remarks with indulgence. With the others my excuse will be that my words may serve as an inducement to them to seek more complete information in that book, which is most delightful reading.

Regarding the origin of the Peruvian race, nothing very positive is known. All the Indian races of the American continent are apparently of very remote antiquity. They have probably descended from men of dissimilar types who immigrated in the early stone age, some from Asia by North America, others from Europe, with which continent it seems probable that means of communication in the shape of islands or intermediate continents may have then existed which have since disappeared. Certain tribes present to this day features that do not admit of a purely Asiatic origin.

Be that as it may, we find that the Peruvian race was the first to attain a comparatively high degree of civilisation. The Aztecs, or Mexican Indians, seem to have come next. As for the Caribbeans, who dwelt in Florida, the West Indian islands and what is now Columbia and Venezuela, the North American Indians, and the Araucanians, who inhabited Chile and Patagonia, all these tribes seem to have remained in a semi-barbarous condition until the time of Columbus and even long after.

In the Neolithic period, the early Peruvians distinguished themselves by the construction of immense buildings consisting of very large blocks of stone (also frequently covered with hieroglyphics) of which remains are visible in Tiahuanaco, on the shores and in the islands of Lake Titicaca, in Chavin, Huánuco and other places. These buildings are due to the Aymará race,

which seems in early times to have centred round Lake Titicaca, and thence extended towards the coast. Another powerful tribe, the Quichuas, occupied the country between the lake and Cuzco. Around these two leading tribes were others which never played any important part in history, amongst them the already mentioned Chinchas of Tarapacá.

The Aymaras and the Quichuas both seem to have developed a fairly high degree of civilisation as early as 200 B.C., and to have then possessed good forms of government. The Aymaras employed much time in erecting colossal buildings, and, with varying success, in fighting the Quichuas, until about the 12th century of our era. About that time a Napoleon was born unto the Quichua tribe. His name was Manco-Capac. He was the son of a chief of Pacaritambo, but such was the success of his arms, that he was for centuries believed to be of divine origin, and was worshipped as the Son of the Sun. He began the foundation of the great Inca empire, which under his successors gradually absorbed all the surrounding tribes. He appears to have despised the architectural ingenuity of the Aymaras, and to have put a stop to their colossal buildings and hieroglyphic carving.

His successors continued and extended his conquests, and about the time when Columbus discovered America, they had extended their rule beyond the present capital of Chile towards the south and as far as Quito to the north. It is estimated that the population of this empire numbered at that time about ten millions. This dynasty bore the name of Incas. Their power reached its greatest height under Huayna-Capac, who died in 1525. This chief, unlike the great founder of the Inca dynasty, was a builder on a grand scale of roads, fortresses, and palaces, and did more than any of his predecessors to develop his country. He made, however, the great mistake of dividing the empire at his death between his two sons, Huascar and Atahualpa, who five years after their accession to power took up arms against one another, and were busily engaged in hostilities when the Spaniards arrived in the country.

The Peruvians had by that time reached a high degree of civilization. Their religion had been originally polytheistic, but

gradually altered into the worship of the Sun, which became the universal religion. A governing priesthood arose, of which the head was generally the brother or the uncle of the reigning Inca. The provinces and towns were ruled by the noble families. The most singular feature of the Inca government was the land law, different from any other ever known. With the exception of certain lands belonging to the noblemen, the remainder of the country was divided into three classes of land; the lands of the Sun (devoted to the priesthood), the lands of the Inca, and the lands of the people. Amongst the latter no such thing as individual property existed. The people employed themselves in tilling, first the land of the priesthood, secondly their own common land, and lastly the lands of the Inca. Marriages, and generally all family affairs, were arranged by the state, and all work was distributed and superintended by the government officials. It was a curious mixture of feudalism and socialism; and seems to have endured successfully for about three centuries. The people worked gold and copper mines, were skilful jewellers, potters, smiths, and weavers. They wore cotton clothing near the coast, woollen clothing in the higher and colder parts of the country. They lived mainly on vegetable diet, and but rarely ate meat. The languages they spoke were the Aymaro and the Quichua, which are still used to the present day amongst the Indians of the interior. They had their poets and even their playwrights. On the whole they seem to have been leading a fairly comfortable life (probably a much happier one than fell to the lot of the average European in those days) in a fertile land and a delightful climate, and under an apparently very paternal government. The invading Spaniard was about to appear on the scene, spreading death and misery over the land.

After several fruitless attempts at exploring the Pacific coast south of Panamá, which occupied three years, and suffering many hardships and the loss of many of his followers, Francisco Pizarro succeeded towards the end of 1527 in reaching inhabited parts of Peru, where he found the natives hospitable and well disposed. Having been well and kindly received by these amiable people, he hastened back to Panama to prepare an expedition for the conquest of their country. The governor of Panama refused, however, to authorise what he considered a

foolhardy attempt, and Pizarro had to return to Spain to obtain permission of the emperor King Charles the Fifth, who willingly granted it, and appointed him governor for life of the yet unconquered country, by a royal order issued in June, 1529. Pizarro returned to Panama, and fitted out an expedition composed of three ships, 185 veteran soldiers, and a few negro slaves, which sailed south at the beginning of 1531.

Meantime, the two Peruvian kings, in ignorance of their impending fate, continued their fratricidal strife with greater bloodshed and cruelty on both sides than had previously been known in the wars of that country.

Pizarro led his small army slowly along the coast, sacking every town and village which he encountered on his march, and after a few months sent back one of his ships to Panama with considerable booty in the shape of gold and emeralds, which were to be sold and employed in procuring reinforcements for his expedition.

By this time the natives had not unnaturally begun to resent his barbarities, and plucked up courage to oppose him. They were, however, beaten in the first encounters, and Pizarro occupied Tumbez, where he established his head-quarters for some time. This occurred early in 1532. The conquest of a country numbering many millions of inhabitants by a handful of Spanish adventurers had now begun in earnest. It was favoured, and made possible, by the bitter war between the brother kings, which entirely diverted their attention from the peril on their shores.

Pizarro then decided on a bold move, and learning that a large army was being led by the Inca Atahualpa against his brother Huascar, he decided to meet it and, if advisable, to fight it, relying upon the superiority of his weapons and on the superstitious fear which the effect of firearms and the sight of his horses (then unknown in America) might arouse in the native breast. He left Tumbez for this purpose with a troop of 177 men all told, of which 60 were cavalry.

Pizarro joined Atahualpa's army in Cajamarca, and offered him assistance against his enemy. Atahualpa accepted the offer, and friendly relations were established. Pizarro invited the

confiding monarch to dinner, a form of invitation which in those times was regarded with some suspicion in Europe. The Inca, however, knew nothing of European mediæval manners, and attended the banquet, when he was seized and imprisoned; two thousand of his followers were murdered, and the remainder of his army dispersed, almost before he had time to realize his mistake. He then bethought himself of offering a ransom to his captor, and, after some haggling, it was agreed that he should regain his liberty on condition that he handed to Pizarro an amount of gold sufficient to fill to a height of eight feet a room measuring 22 feet by 16. I am not aware that the value of this amount has ever been calculated. Allowing a discount of 10 per cent. for interstices (and we may assume that Pizarro's followers would have seen the gold packed fairly close) the net cube would have been 2,534 feet, the weight 1,300 tons, and its value in our day £166,400,000 sterling; in those times probably five times as much. We may suppose that Atahualpa was endeavouring to gain time, perhaps he did not know exactly what his promise entailed, but, be that as it may, he issued orders for all the gold in the palaces, temples, and other places to be brought in, and in the meantime that no hostility was to be shown to the Spaniards.

During the captivity of Atahualpa his troops succeeded in capturing his brother and enemy, Huascar. After consulting Pizarro, Atahualpa gave orders for his execution; but he did not long survive his rival; the eagerness of his captors to divide the spoil did not give him time to collect the whole amount agreed as his ransom, even if this had been possible; the gold delivered is said to have amounted altogether to about £800,000, which was divided amongst Pizarro's followers; and then for some obscure reason (for the act does not seem to have been politic or expedient) the Inca was hastily tried and executed, under an accusation of treason. He was put to death on the 29th of August, 1533. His murderers seem soon to have realized that they had made a mistake, and threw the blame of this crime upon one another. These recriminations were all the more bitter, as the inflow of the gold ransom had stopped after the Inca's death.

The country was now given over to anarchy, to remedy which Pizarro bethought him of appointing a successor to Atahualpa, and for that purpose chose one of the dead emperor's sons, whom

he caused to be proclaimed as the Inca Toparpa. This arrangement seems to have had at all events a temporary and local success, and it had the further advantage that while giving satisfaction in his immediate neighbourhood, it left Pizarro free to pursue his plan of conquering the whole country, on which project he as soon as possible set out towards the south with an army of 500 men. He took and sacked Cuzco and other towns, seizing enormous sums of gold. His lieutenant Belalcázar, with 140 men, in the meantime subdued the northern part of the country as far as Quito.

In 1535 Pizarro founded the city of Lima, ever since then the capital of Peru, and in the course of the same year, several other cities in different parts of the country.

However, in the following year, an insurrection broke out in Cuzco, which Pizarro overcame after some severe fighting, and, for the first time, with great loss on the Spanish side.

After this victory, little trouble was to be apprehended from the conquered race. Spanish colonists kept pouring into the country; and, as it has frequently happened on similar occasions in the world's history, the conquerors then turned to fighting one another. Bitter feuds sprung up between Pizarro's brothers and his other lieutenants; murder and treachery were rife for some years. These disputes culminated in the murder of Francisco Pizarro himself by a few mutinied officers in 1541. Thus perished at the age of 65 this extraordinary man, who in the short space of from four to five years, and against the greatest odds probably encountered by any conqueror, had succeeded in subduing and practically reducing to slavery a powerful and civilized nation of eight or ten million inhabitants, and in gaining for Spain the richest colony she ever possessed. He was unscrupulous and cruel, like most mediæval soldiers of fortune; but, though of humble origin, and almost illiterate, a man of great military genius, and undaunted courage.

His former associate, Almagro, who had instigated his murder, now proclaimed himself governor, and attempted to hold his own against the envoy of the Spanish king sent to punish his crime. He was, however, taken prisoner in Cuzco and put to death with many of his followers.

It was then decided by the Court of Spain that Peru should in future be governed by a viceroy, and a nobleman named Blasco Nuñez was sent out with that title.

One of the conqueror's brothers, Gonzalo Pizarro, strove to resist the viceroy, made him prisoner, and sent him back to Panama under escort. The viceroy, however, succeeded in landing at Tumbes on the way, and formed an army in the neighbourhood of Quito. He was shortly afterwards murdered by one of Gonzalo Pizarro's followers.

This rebellion caused an enormous sensation in Spain ; it was apparent that force could not be applied for the moment. Gonzalo Pizarro was not only master of Peru, but the authorities of Panama and the whole of the Spanish fleet were secretly in sympathy with his cause. He had amassed immense wealth which he distributed with a free hand to his supporters. In these difficult circumstances, the Court of Spain sent out a clerk in holy orders named La Gasca, who proved to be one of the most able diplomatists in the world's history, for alone, without escort or advisers, protected only by the contempt which his apparent helplessness inspired, he succeeded in landing in Peru, and by a most masterly series of intrigues, in gradually detaching from Gonzalo Pizarro all his most powerful supporters. He eventually formed an army which, after several hardly-fought battles, defeated and killed Pizarro and the most prominent of his remaining followers in the neighbourhood of Cuzco.

La Gasca then undertook the government of the country, and proved an able, just, and merciful viceroy. He governed for a period of three years, and then returned to Spain. During the term of office of his successor, sundry attempts at rebellion were made by some of Pizarro's old lieutenants, but they were promptly and vigorously suppressed, and it may be said that after the date of 1560 the history of the colony became practically uneventful until modern times.

In 1569 the Spanish Inquisition was established in Peru. Though its cruelties in that country were less numerous than in Spain itself, it is recorded that from that date until the early years of the 19th century, when it was suppressed, the Tribunal of the Holy Inquisition in Peru put to death at the stake about thirty people, mainly for heresy, and otherwise punished many hundreds of others.

The colony suffered at times from the inroads of privateers belonging to countries at war with Spain. Drake made sad havoc of the coast towns in 1577, sacked Callao and generally disturbed the newly established peace of the country. Ten years later, Cavendish made himself equally objectionable.

A Dutchman called Spitberg, broke up the Spanish fleet in Callao in 1615, and carried off a large amount of loot. About 1680 the Pacific coast was troubled for some years by the famous buccaneers. These were, however, dispersed by a Spanish fleet in 1685. During the war between Spain and England in 1739, the Peruvian coast towns suffered considerably from Admiral Anson's attacks. With the exception of these occasional troubles the country remained internally peaceful during that long period. Much gold and silver was exported from the country to Spain, and occasionally intercepted by English men-of-war and privateers; many disputes occurred between the civil authorities and the clergy, and many more amongst the clergy themselves; but generally speaking things went fairly smoothly, until in 1780 a formidable Indian rebellion broke out under the chief Tupac Amaru, which nearly cost the Spaniards the loss of the colony. But a strong army was soon organised and Tupac Amaru was defeated and taken prisoner. He was put to death, after having been tortured with extreme cruelty.

The course of Spanish mis-rule then ran smoothly again until the movement in favour of independence began to spread all over the Spanish colonies in South America, in the beginning of the 19th century. An account of this struggle would extend far beyond the scope of this paper, for the civil wars in the different countries were so closely connected with one another that a separate description of the Peruvian fight for independence would be almost impossible. The struggle began in earnest about 1820 in Peru, and the Declaration of Independence was made on the 28th of July, 1821. But Spanish troops still held part of the country, and the fighting only came to an end by the surrender of Callao, 23 January, 1826.

The early years of Peruvian independence were marked by bitter and continual civil strife, which continued until 1844, when General Castilla was elected president. He was a strong and

intelligent ruler, born in the province of Tarapacá. This was probably the first instance in the history of the country of any eminent man having come forward from that district.

He succeeded in maintaining peace in Peru during the six years of his first term of office. During that period the first railway from Callao to Lima was constructed by an English company, and the finances and administration of the country were for the first time put into fair working order. His successor, General Echenique, seems to have given some cause of complaint, for, after some three years of government, he was turned out by a revolution, and General Castilla came again into power, until 1862. He was succeeded by General San Roman, and subsequently by General Pezet, during whose term of office trouble arose with Spain, which culminated shortly afterwards in war between the mother country and the allied republics of Peru, Chile, Ecuador, and Bolivia. On 2 May, 1866, the Spanish fleet bombarded Callao; the engagement lasted four hours, and considerable damage was done on both sides. The Spanish fleet shortly afterwards sailed homewards, and hostilities came to an end. Peace, however, was not signed between Spain and Peru until 1879. The Spanish war occurred during the presidency of General Prado, who was turned out by a revolution headed by General Canseco in 1867; after ruling the country for six months, General Canseco handed the power to Colonel Balta, president-elect, whose period of office was memorable in many ways; for the immense impulse given during that time to public works and to the commerce of the country, and for Balta's tragic death.

Balta and his advisers decided to commence the construction of railways on a gigantic scale, and, with this end in view and also for the purpose of paying off the accumulated deficits of the Peruvian budget, they issued in Europe through the French firm of Dreyfus, two large loans in 1870 and 1872, which, together with previous loans, brought the total indebtedness of the nation up to £36,000,000 sterling. In connection with these financial operations, a sale of two million tons of guano was agreed with the said firm of Dreyfus.

The guano had been for some years a most profitable article of export for the Peruvian nation. Its sale on consignment had

constituted more than two-thirds of the country's revenue. Very large quantities of this substance still existed in the Chinchas and Lobos Islands, and in some places on the mainland, when Balta's presidency began. Exportation then began at a very rapid rate, as a consequence of the Dreyfus contract.

The proceeds of the foreign loans were expended in a lavish manner on railways and different public works, hastily and often injudiciously designed, and paid for at extravagant rates. Many influential citizens came to the conclusion that the resources of the nation were being uselessly squandered, and a strong party was formed in opposition to Balta's policy, headed by Don Manuel Pardo. It became evident that Pardo would be elected president in 1872, and the military party became anxious to retain power at any cost. As however President Balta seemed unwilling to appeal to force, the minister of war, Tomas Gutierrez, seized and imprisoned him, and proclaimed himself Military Dictator, and dissolved Congress. This action was followed by a popular rising in Lima. The army did not stand by Gutierrez as he had expected, and some of the troops began to desert. Then one of Gutierrez's brothers, also an officer in the army, put President Balta to death in the cell where he had been imprisoned, and by this foul act turned the scale against his own party, for the mob rose and actually tore the dictator and two of his brothers to pieces. Then in August of the same year President Pardo, being duly elected, assumed power, and remained in office until the end of his constitutional period in 1876. He was murdered two years later, when president of the senate, by a soldier who was on duty as sentry outside the House.

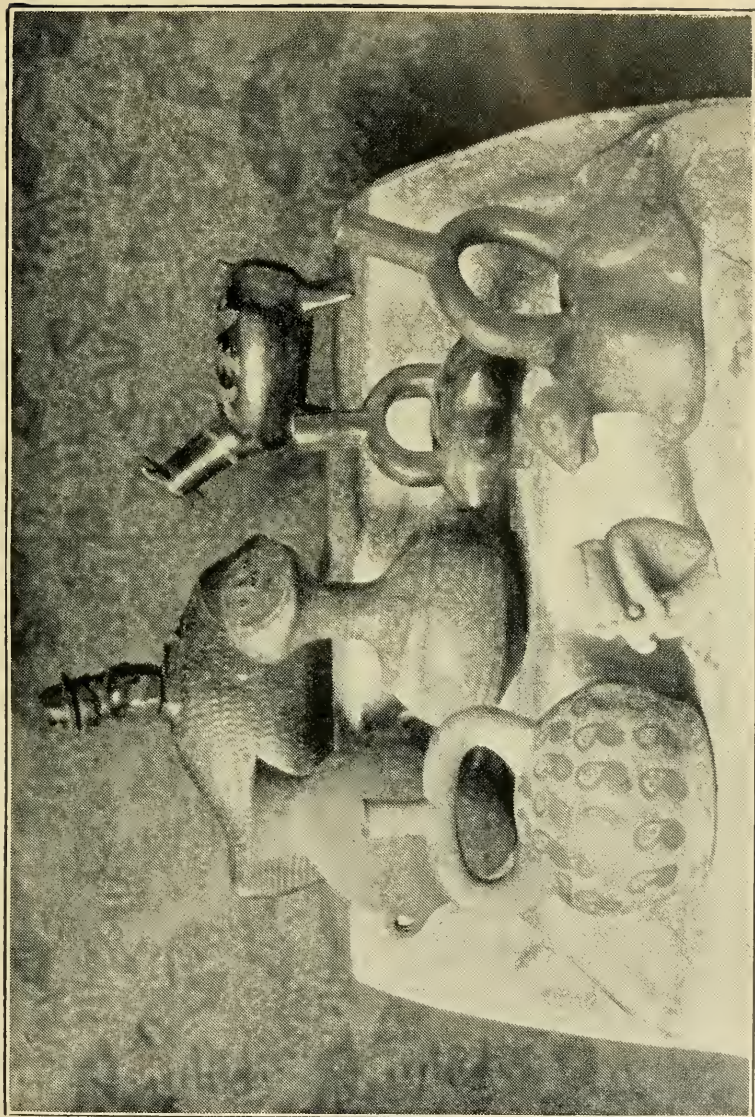
At the outset of his presidency, Pardo was confronted with serious financial difficulties, the consequence of his predecessor's extravagance. These difficulties only increased as time went on, and his successor, General Prado, was compelled to suspend the payment of interest on the foreign loans. The construction of the railways was suspended, and the credit of the nation ruined.

Such was the condition of the country when the war with Chile broke out in April, 1879. And now at last the province of Tarapacá and its staple (and in fact almost only) product nitrate of soda for the first time came to the front in the politics of the

country, after centuries of peaceful obscurity. For nitrate of soda was the cause of the war between Chile and Peru, which resulted in great accession of wealth to the former country, and in the consummation of the latter's financial ruin.

The origin of the quarrel was a somewhat complicated question about nitrate grounds in Bolivian territory near to the port of Antofagasta, some little distance to the south of Tarapacá, where Chilian citizens possessed certain interests. Peru thought fit to support Bolivia, in compliance with a secret treaty which had existed between both republics since 1873. Chile gladly accepted the challenge, conscious of her strength, having little fear of Bolivia, and having long cherished a desire to become possessed of the valuable nitrate grounds of Tarapacá. The course of the war would take too long to describe. Suffice it to say that it ended, after two years of bitter fighting, in the occupation of Lima by the Chilian forces, and the crushing defeat of Peru. The Chilians permanently annexed the coveted nitrate grounds at Tarapacá, and took possession for a term of years of further territory to the north known as Tacna and Arica. In the meantime, after the first Chilian victories, President Prado had been driven out of the country by the pressure of public opinion. He was succeeded by a dictator, Don Nicolas de Pierola, who in his turn gave way to General Caceres. The latter again gave way to Colonel Iglesias who signed a treaty of peace with Chile at Ancon in October, 1883, giving up the southern territories on the terms described above.

After the evacuation of the country by Chile, civil war sprung up between the rival parties in Peru, ending in the triumph of General Caceres in June, 1886. Caceres completed his constitutional period in 1890, and was succeeded by President Morales Bermudez, who like Castilla was a native of Tarapacá. Since then, there has been no noteworthy political disturbance in Peru, and that country has been during the last few years gradually recovering from the disastrous effects of the Chilian war. We may note that under the rule of President Caceres in 1889, Peru gave up its railways for a term of 60 years to its foreign bondholders, united under the title of the Peruvian Corporation, as consideration for the release from all its foreign liabilities, then



amounting to 280 million soles, or a par value equivalent to £56,000,000 sterling.

As we have already noted, the province of Tarapacá, containing the principal nitrate districts of South America, sprung into universal notoriety at the outset of the Chilian war. It had been, however, highly productive, and was well known in commercial and agricultural circles long before that period. The fertilising qualities of nitrate of soda began to be known as early as 1830, and from that period ever increasing quantities of the article had been exported to Europe. It soon took rank as a staple article of the world's commerce, and towards 1870 had become of sufficient importance to justify the construction of the nitrate railways, which convey the manufactured article to the coast. Since the construction of these railways, the production of nitrate has enormously increased, and the annual export is now fast approaching the figure of $1\frac{1}{2}$ million tons per annum. The lion's share of this trade falls to the Chilian government, who in good or bad years relentlessly exacts its export duties amounting to £2 12s. per ton. We, the less fortunate owners of the grounds and manufacturers of the article, have to be content with far less than that sum in good years, and must cheerfully submit to a loss in bad ones.

It is no doubt a fantastic notion and foreign to the traditions of this grave and scientific society, but in my final reference to my text, dazzled as I confess to be by the romance of my theme, I may be pardoned for hinting (since I have no better explanation to offer) that perhaps some forecast of the varying turns of fortune I have made bold to relate may be hidden in the hieroglyphics of our mysterious stone, and which, if deciphered in time, might have proved useful to the men whose careers we have glanced at, and to those of us whose interests are bound up with the country whence it came.

With regard to the plastic arts, as already indicated, the ancient Peruvians attained to some technical excellence, their artistic feeling was within certain limitations not undeveloped, and indeed examples of statuary and of the potter's industry which I have seen, though not notable for excellence in detail and indeed too often merely grotesque and at times indecent,

display in many instances a fair appreciation and application of artistic principles, not only in colour, but in material and in general design.

The group of pottery of which an illustration is here given is from the northern part of Peru, for, though I have found specimens of pottery in ancient graves in Tarapacá, none of it was other than crude and valueless both in workmanship, material, and design.

All the old Peruvian pottery, now extant, has been taken from burial places, affording another example of the once almost universal custom of providing the departed with the means of subsistence and of proper display in the future state. Some of the vases held maize and others grain, while some no doubt were filled with water, and others again were added as the appropriate personal belongings of the deceased, who was also provided with garments, bows and arrows, fishing gear, etc., and, in the case of nobles and chieftains, with their ceremonial attire, and even with gold and silver in the shape of images and adornments.

Again, the artistic instinct took another form with these ancient inhabitants of Peru, and their habit of depicting figures on the hill-sides was as strikingly displayed as in the case of our Saxon forefathers.

In Peru the llama took the place of the white horse in Wiltshire, and we still find numberless representations of this animal, as also of the kindred vicuñas and guanacos, depicted on the hill-sides, either singly or in groups, and occasionally in conjunction with geometrical figures, and representations of human beings.

Whether these figures were the outcome of mere fancy, or of superstition, or for astronomical purposes, I am unable to say. In places I incline to think they are ancient landmarks, probably sign posts to wayfarers. But whatever prompted their production, these "painted hills," as the Spaniards called them, are a curious and most interesting record of an almost forgotten past, and I am glad to say they are in many cases so well preserved as to promise interest and instruction to the traveller for many generations to come.



The illustration of "painted hills" here offered represents what may be seen in many parts of Peru, and especially along the slopes which border the southern deserts, notably Tarapacá and the adjoining provinces, and on the rocky walls of the few rivers which traverse those sandy wastes where the rainless climate permits the preservation for ages of these curious relics of bygone inhabitants.

I must here state that my thanks are due to Mr. Ed. Manly, M.I.C.E., formerly Engineer-in-Chief of the Nitrate Railways Co., and Mr. Herbert J. Griffin, the present managing director of that undertaking, for their kind and important assistance in the preparation of this paper.

THE ANNUAL EXCURSION, 1903.

On Tuesday, 18th August, members and friends of this Institution had their Annual Excursion. The company, who assembled at the railway station at Truro on the arrival of the 9.45 a.m. train, and joined it during the day, included Canon Harvey, Rev. T. M. Comyns, Rev. H. H. Mills, Professor Clark, Messrs. J. D. Enys, A. P. Jenkin and Miss A. Jenkin, Messrs. G. M. Iago (London), T. C. Peter, R. H. Williams, and the Misses Beatrice, Frances, and Florence Williams, Miss Ruth Polkinhorne, Mr. S. Jones and Miss Jones, Messrs. W. J. Clyma, H. Barrett, H. James, H. H. Share, Joseph and Mrs. Rogers, Messrs. J. W. Towan, W. Magor and Mrs. Magor, Mrs. W. H. Brewer, Major Parkyn (Hon. Sec.), and Mr. George Penrose (Curator).

The party drove through Tresillian to Probus,⁽¹⁾ where Canon Harvey, the vicar, kindly gave us information regarding the parish church. He prefaced his remarks by the statement that the village was particularly deficient in ancient houses. The only one with any feature of interest was that close to the National Schools, belonging to the Hawkins family, with a sculptured figure inserted in the wall, about which nothing definite was known. Of St. Probus and St. Grace, associated with the parish, absolutely nothing is known.⁽²⁾ They supposed from their names that they were Latinized Britons, who evangelized that part of the country. Of the history of the church they knew nothing till Athelstan conquered Cornwall, nearly a thousand years ago. He, it is supposed, found a church there; he made it collegiate, and so probably much larger, founding a chapter with dean and canons.⁽³⁾ In 1268 the dean, Henry de Bollegha, ceded to the bishop the future right of collating to prebends.⁽⁴⁾ No dean has since been appointed, but the office

1. The members of this Institution visited Probus and Golden in 1881. See *Journal*, vol. vi, p. 423.

2. What is the earliest mention of these two saints in connection with the parish? We are inclined to think it is modern.

3. Is there any satisfactory evidence in support of Athelstan's alleged action?

4. The dean's letter, dated 19 Jan., 1268, is printed by Mr. Hingeston-Randolph in *Regr. Bronescombe*, p. 255.

appears to have merged in that of the ordinary. The bishop when visiting this church occupies the stall formerly the dean's. The chapter continued till the reign of Edward VI. The tower is believed to be of the reign of Queen Mary, and it is wonderful there should be such beautiful work so late as that.⁵ Tradition said of the three niches on each of the north and south sides of the tower that there were six statues made for them, but they were never allowed to be put in position. That might possibly be true; because, if the statues were made and were finished at the end of Mary's reign, at the beginning of Elizabeth's, circumstances having altered, they might not have been allowed to be erected. The tower had been measured, and was found to be 105 feet 6 inches to the top of the battlements, and 123 feet to the top of the pinnacles. Shortly after this visit of our Institution to Probus, the vicar of Fowey had that tower re-measured, and found it 119 feet to the top of the pinnacles, 104 feet to the top of the battlement. Probus tower is, therefore, the highest in the county. On the north side of the tower in the churchyard was pointed out the tomb of Mr. and Mrs. Carveth, of Barteliver, the grandparents of the late Archbishop Temple, whose birth and baptism, though he was not born in England, were entered in the margin of the Probus register, probably with a view to getting his name registered in some English parish. On the south side was pointed out the Sanctuary, the residence of the vicar. It is said that King Athelstan gave rights of sanctuary, and they were continued till such rights were done away with in the reign of James I.

Everybody was struck not only with the external beauty of the fabric, but with the interior. On the tower wall there exist in good preservation the royal arms of James II, with the unicorn as supported. The carved wood screen beneath the tower arch, a preservation from past wreckage of the church fittings, bears a cross and A B C D E. The vicar said he could give no explanation of them himself, but he had been told that the cross was the symbol of the tenor bell, and that, with the

5. On Probus Tower, see *Trans. Exeter Dio. Archit. Soc.*, vol. 1v (where is a good elevation) and *Journal R.I.C.*, vol. 1x, where Mr. H. M. Whitley gives some valuable notes on the date from the Public Records. The evidence for the date generally given (Q. Mary) does not seem very strong.

letters, it indicated the number of bells in the tower. The numbers agreed. The bells are (the vicar stated) the largest and finest in Cornwall. The church was restored in 1851, Mr. Street being the architect. Such of the old oak of the roof as was found good was put into the north aisle. He made two new roofs, but Canon Harvey had always wished he had given them Cornish wagon roofs throughout. The bench ends at the time of restoration were, with portions of the old screen, made into a screen at the entrance to the chancel. They bear the date 1591 and the following words: "I.H.S. hear us Thy people, and send us Grace and Good for ever." It was a play upon the names of Probus (meaning "good") and Grace, the (alleged) patron saints. The upper part of the present screen has been added since, and is the work of Mr. Harry Hems, of Exeter, from designs of Mr. Frank St. Aubyn. The church having been at one time collegiate is furnished with return stalls. When it was restored the ancient stone *mensa* was found under the altar. It was restored to its place. It bears the usual five crosses and spear. At the same time a *piscina* was found in the tower; it is of Norman workmanship, and of Catacleuse stone. The shaft is detached. It now stands within the altar rails. Two skulls were found in an ambry in the north wall. These were buried under the altar, but when the reredos was put up the workmen had to remove them, and they are now preserved in their original place, enclosed with glass.

"If you ask me," said the Canon, "if they are the true relics of SS. Probus and Grace, I cannot tell you; but the relics of local saints were always put into the walls of the north side of the sanctuary of the church, as the arm of St. Neot was in that Parish church, and the relics of St. Eanswith at Folkestone." A portion of a brass was pointed out in the south aisle. It was to the memory of John Wolveden and his wife. In 1513 they lived at Golden. A portion of the brass had been stolen during the time of Canon Harvey's predecessor. Subsequently there came from Canada a confession of the dying thief; but unfortunately he never sent the missing brass back. The aisle was called the Golden aisle, and the inhabitants of Golden had always had a seat in it, Mr. S. Hearle, the present occupier, having one to-day. The reredos and decoration of the chancel

roof are both in memory of Prebendary R. W. Barnes, the last vicar. The reredos is of coloured glass (*opus sectile*), by Messrs. Powell, of Whitefriars; the central part representing the Crucifixion.

The decoration of the chancel roof was designed by the Rev. S. Cooper, and carried out by Messrs. Solomon & Co., of Truro. The iron gates of the chancel were designed by Mr. Cooper, and executed by Mr. Duff, of Probus.

The fine E. window was given by Preb. Barnes: the subject is the Ascension.

We next proceeded to Golden, or "Wolveden," as it is spelt in old documents. At present it is a farm house, occupied by Mr. S. Hearle, but bears externally a few traces of its ancient splendour, a fine old Tudor doorway being the chief feature of interest. In the grounds is a curious and very interesting building, supposed by some (but without evidence), to have been the hiding place of Cuthbert Mayne, chaplain to Francis Tregian, of Golden. He was captured here in 1577, taken to Launceston and executed, having the distinction of having been the first seminary priest executed in this country. There is a partial description and a drawing of the "hiding place" in vol. 13 of this Journal. Inside the house is a very beautiful and well-preserved old carved oak chimney-piece of the late Tudor style. The buildings now in use as farm buildings are very interesting. Over the stable door is an ancient sundial, and an old and beautiful stone fire-mantel forms the head of a doorway. Remains of the old domestic chapel are seen in the stables, and the winding staircase of the former tower is cut short at the hay loft. Arched roofs, moulded granite windows, and many indications of the former beauty of the place are now but features in the modern buildings.

Before leaving the manor of Golden we went to the adjacent site of an ancient camp. It has, unfortunately, never been examined by any competent person, and the visitors each arrived at his own opinion of its date. A note on it, accompanied by a plan, will be found in the 30th report of this Institution, p. 24. From the old walls a fine view of the surrounding country, with the Fal valley, at its highest sources, is obtained.

Having thanked Mr. and Mrs. Hearle for their kindness in assisting us to see the interesting features of Golden, we proceeded to Trenowth, Grampound-road, where, in the newly-erected bungalow, we were entertained at lunch provided by our president, Sir Robert Harvey, the owner of the estate. During lunch the weather showed signs of breaking, and showers fell. The company having drunk to the long life and happiness of Sir Robert Harvey, the Rev. T. M. Comyns gave us a few interesting statements about Trenowth Manor. He pointed out that there were two ancient encampments upon the estate—one at Grampound-road, and one in the middle of Trenowth wood. Upon the manor in the old days there were three chapels or oratories—one belonging to the old mansion of Trenowth, another at Chapel Rock, and a third close to Grampound-road village.⁶ The old mansion was in the usual form of an E, and faced East. Remains are still to be found. Two old arched granite doorways are set up in the garden wall, one of which seems to have been associated with the chief entrance, the other with a back door. In one of the cottages is the tracery of a Perpendicular window, and in the front of the cottage there are set into the wall several coats-of-arms carved in stone blocks, representing, among others, the Herle, the Trenowth, and the Carminow families. There are still bits of the labels formerly over the mullioned windows. The terraces of the gardens may be seen north of the house. The family of Trenowth in the male line died out in the reign of Henry VIII. Nicholas Herle, of Trenowth, by his will in 1559, desired to be buried in the "Jesus aisle" of Probus Church. The Herle family came to an end in 1737 by the death of Northmore Herle, who left his property to his six half-sisters, the daughters of Chas. Kendall, D.D. The last of those died in 1806, when by private Act of Parliament the property was sold to Mr. C. Rashleigh, of St. Austell, who sold it to his nephew, the first Sir Colman Rashleigh. Mr. Comyns' interesting little sketch was heartily appreciated, and the rain having cleared off, we thanked him and proceeded to Chapel Rock in the woods overlooking another

6. On 8 Jan., 1405, license was granted to Ralph Trenewyth and Joan his wife for oratory in their mansion of Trenewyth, and in the chapels of the Holy Trinity and B.V.M., within their demesne of Trenewyth, in St. Probus (Regr. Stafford, I. 72b).

portion of the Fal valley, and commanding a beautiful and extensive view of the surrounding clay country, in which we were soon travelling towards the Terras China Stone Mills. Over these the party were shown by Mr. Joseph Rogers, who most interestingly explained the various processes in the manufacture, while at the Wheal Remfry China Clay Works, which were next visited, he explained the raising and preparation of the clay.

At Wheal Remfry our hospitable president had provided tea for the party. The drive home through Ladock valley was enjoyable, in spite of occasional showers. The arrangements throughout the day were admirable, and thoroughly justified the hearty thanks expressed to Major Parkyn and other officers of the Institution who were responsible for them.

Royal Institution of Cornwall.

85th ANNUAL MEETING, 1903.

The Annual Meeting of the Royal Institution of Cornwall was held on the 3rd of December in the Library of the Institution, the retiring president (Sir Robert Harvey) occupying the chair. There were also present Sir Edwin Durning-Lawrence, Bart., M.P. (president-elect), Sir John Alleyne, Councillor J. J. Smith (Mayor of Truro), Ven. Archdeacon Cornish, Revs. D. G. Whitley, W. E. Graves, and H. H. Mills, Dr. Clark, Dr. E. Sharp, Messrs. J. D. Enys, F.G.S., T. C. Peter, T. L. Dorrington, E. L. Carlyon, J. Rogers, H. Barrett, R. Vallentin, F.L.S., W. A. Rollason, E. Kitto (Falmouth), W. G. N. Earthy, George Heard, R. Fox, W. Barratt, J. Morrish, R. Dixon, W. Norton, Hamilton James, W. W. Ward, A. P. Jenkin, S. Jones, T. Worth, F. H. Davey, F.L.S., F. A. Cozens, E. F. Whitley, Major Parkyn, F.G.S. (Hon. Sec.) and Mr. Geo. Penrose (Curator), Lady Warrington Smyth, Mesdames Dixon, Kitto, Borlase, Clark, Rollason, Share, Jenkin, Thomas-Peter, Carlyon, Morrish, the Misses Alleyne, Reynolds, Peter, Paul, Tomn, Burrel, Snell, Rogers, Cornish, Nichol, Vigurs, Jenkin, Carlyon, James, and others.

The President expressed his pleasure at seeing such a number of members present on that, his last appearance as president. His successor was to be Sir Edwin Durning-Lawrence, whose ability assured for the Institution a successful time.

Major Parkyn then read letters regretting inability to be present from the Earl of Mount Edgecumbe, the Bishop of Truro, Sir Vyell Vyvyan, Bart., Chancellor Worlledge, Canon Donaldson, Canon A. P. Moor, Rev. S. Rundle, Rev. T. Taylor, Rev. W. Iago, Mr. Howard Fox, Mr. W. Naylor Carne, and Mr. James Osborne.

The minutes of the Annual Meeting having been read and confirmed, the Curator (Mr. George Penrose) presented the Annual Report.

85TH ANNUAL REPORT OF THE COUNCIL.

In presenting their 85th Annual Report the Council have much pleasure in being again able to speak of the continued prosperity of the Society.

The structural alterations to the buildings that were so successfully carried out last year have added much to the general appearance of the museum, and have afforded much-desired additional space for laying out the numerous exhibits acquired by gifts and purchase, which have so greatly increased the value of the collections.

The loss of members during the past year, however, has been seriously felt, for we have to record the death of the following gentlemen:—Sir Charles B. Graves-Sawle, Bart., Mr. George Hicks, of Pentowan, Newquay; Mr. W. E. Baily, Mr. B. Blenkinsop, Mr. F. King, surgeon; Mr. James Henderson, C.E.; Mr. Silvanus Trevail, and Monsieur L. Moissenet.

Sir Charles B. Graves-Sawle was one of our oldest members, having joined at the death of his father, Sir Joseph Sawle, some 40 years ago.

Mr. George Hicks, although a member of a few years' standing only, had, for a considerable period, shewn much interest in our society.

Mr. W. E. Baily had, at the time of his decease, been a member for some ten years and but for his indifferent health would have taken a more active part in our proceedings. He was for some years a member of our Council. It will be remembered that on our excursion to his neighbourhood in 1898 he hospitably entertained our party at his beautiful residence, Lynwood, near Penzance.

Mr. Blenkinsop, a member of a well-known Cornish family, although himself living in a distant county, showed much interest in our Society.

Mr. King, the well-known surgeon of this city, was a great friend of the institution, and having tastes akin to the objects

of the Society, helped it by sending many valuable presents. He was well-known for his philanthropy and for his kindness and generosity to the poor.

Mr. Henderson's genial presence and witty speeches contributed to the success of our meetings during many years.

It is our painful duty also to record the death of Mr. Silvanus Trevail, a well-known figure at these meetings. He had the interest of the Society greatly at heart, and was ever ready to assist us in our work by his professional advice. It was only a few days before his death that he visited the museum and expressed his pleasure and satisfaction at the improvements that were being carried out.

In concluding this obituary notice the Council would like to refer to M. Vivant Léon Moissenet (1831-1901) formerly professor of assaying in the Ecole des Mines, Paris. He was the author of several papers on the Mineral Veins of Cornwall and an Associate of this Society.

The year has been a record one in many ways, especially with regard to the additions to the museum and library.

The first to claim attention is the Rashleigh collection of minerals. This large and important collection has now found a resting place in our museum, thanks to the prompt action and generosity of Mr. Enys and other friends including Dr. Richard Pearce, a Cornishman now at Denver, Colorado, who contributed £100 to the amount required. Many of the specimens are the finest of their kind that have been produced from Cornwall, and it would have been a serious loss had the collection been allowed to go out of the county.

Col. Sir Francis Graves-Sawle, Bart., C.V.O., shortly before his death presented the whole of the collection of more than 200 cases of British birds, made by his father, the late Sir Charles Graves-Sawle, Bart. Many valuable and rare specimens are to be found in the collection, including the American Green Heron, which was shot by the game-keeper at Penrice, on October 27th, 1889, and which is the only example ever taken in Europe. This bird was exhibited before the members of the Linnean Society at their meeting, on April 17th, 1890, and has since been figured in Lord Lilford's work on British Birds.

The collection has been temporarily arranged in one of the rooms downstairs, and will remain there until the work of re-arrangement has sufficiently advanced to allow of its being placed with the general collection. The Institution is indeed fortunate in having secured this valuable and important collection, and the Council desire to express their thanks to Mr. J. D. Enys for the interest he shewed in the matter, Col. Sir Francis Graves-Sawle having consulted him as to the most suitable place in the county in which to deposit the collection. A complete list of the birds will be given in the Journal.

Mr. J. D. Enys' name again figures largely in the list of donors. The case of ten Cornish wagtails presented by him is well set up and contains no less than five of the different species recorded for the county. There has also been received from him a beautiful slab of New Zealand jade, cut from a large stone which belonged to the natives of that country, and a fine specimen of the mineral Enysite, from St. Agnes. It is interesting to note that Enysite was first found at this place and was named after Mr Enys' father.

The Cornwall County Council Fisheries Committee, having found it advisable to close the Fishery Museum, which existed for some time at Falmouth, kindly handed over to us their collections of shells and preserved fish and also a number of valuable works on fishes and fisheries.

Mr. Alderman Dorrington has presented a most interesting series of fishing appliances from the South Sea Islands. Among other things are fish hooks of human bone and fishing lines of human hair.

The portraits in oil of Lord de Dunstanville, William Mansell Tweedy, and J. H. Tregellas have been cleaned and restored by Mr. Rollason, and are now hung in the Entrance Hall. The portrait of Anthony Payne, the Cornish giant, has also been restored by the same hand, at the expense of the donor of the picture, Sir Robert Harvey, to whom our special thanks are due. Great credit is due to Mr. Rollason for the masterly way in which the work has been done.

The number of visitors to the museum continues to steadily increase. During the past twelve months 5,563 persons have been to examine the collections.

Admitted free	..	..	4,535
Members and friends	..	..	722
Admitted by payment	..	..	306
			Total .. 5,563

The increase in numbers on past years is due, no doubt, to the recent valuable additions, and to the improvements which are being made with a view to rendering the collections more useful to those desirous of studying them.

A scheme for exhibiting the mineral collections has been worked out by the curator, Mr. George Penrose, and has been approved by the Council. Space has been allotted for the accommodation of fourteen desk-shaped cases to contain the general collection. In response to the wish of the special committee appointed to consider the arrangement and display of the minerals, the curator designed a very beautiful case which the Council, after consideration, adopted. The upper part is air-tight and of plate-glass, and is intended to contain specimens selected either for their beauty or rarity, or because they illustrate some special feature of the science; whilst the lower portion consists of thirty drawers to receive duplicates and specimens that would be injured by exposure to light. A sample case has been made and placed in position in the museum, and contains the first group—the native elements. The group is complete and the specimens are properly classified, and, in order to give them an attractive appearance, each is placed on cotton wool in a black wooden tray with a printed label, making the series both interesting and intelligible. A notable feature is that all Cornish specimens have pink labels.

It is intended to adopt the same method in laying out the other cases as soon as they can be obtained. In order that this important work may be completed, and the collections made accessible to students and the public, funds are urgently required for the provision of thirteen similar cases. Until such cases are provided the valuable and important collections of minerals now available cannot be displayed in an adequate manner; indeed, the greater portion cannot be exhibited at all. The collections are the finest that can be found in any provincial museum, and,

seeing that so many of the specimens have been raised from the mines of Cornwall, it is hoped that with the assistance of friends it will be possible, at an early date, to provide the necessary cases.

The annual excursion was held on Tuesday, the 18th of August last, Probus, Trenouth, and St. Stephens being the district selected. After visiting the beautiful church at Probus, the party drove on to Golden and examined the remains of the Priest's Hiding-place and also the ancient camp close by. From thence they proceeded to Trenouth where, by the kind hospitality of the president, Sir Robert Harvey, lunch was partaken of. In the afternoon a visit was made to the Terras china-stone works and the Wheal Remfry china-clay works. The day proved a thoroughly enjoyable one to the party.

The President's term of office expires to-day, and it affords the members of the Council much pleasure in proposing that Sir Edwin Durning-Lawrence, Bart., M.P., be elected President for the next two years in succession to Sir Robert Harvey. They also recommend that the following officers be appointed for the ensuing year :—

President :

Sir EDWIN DURNING-LAWRENCE, Bart., M.P.

Vice-Presidents :

Mr. JOHN D. ENYS, F.G.S.
The Rt. Hon. L. H. COURTNEY.
Rev. S. BARING-GOULD, M.A.

Sir J. LANGDON BONYTHON.
Mr. J. C. WILLIAMS.
Sir ROBERT HARVEY.

Treasurer :

Mr. A. P. NIX.

Secretaries :

Major PARKYN, F.G.S., and Rev. W. IAGO, B.A.

Other Members of the Council :

Ven. Archdeacon CORNISH, M.A.
Mr. HOWARD FOX, F.G.S.
Mr. HAMILTON JAMES.
Rev. D. G. WHITLEY.
Rev. Canon A. P. MOOR, M.A.

Chancellor PAUL, M.A.
Mr. THURSTAN C. PETER.
Rev. S. RUNDLE, M.A.
Mr. JAMES OSBORNE, F.G.S.
Professor J. CLARK, D.Sc., M.A.

Corresponding Secretary for East Cornwall :

Rev. W. IAGO, B.A.

Joint Editors of the Journal :

Mr. THURSTAN C. PETER and Major PARKYN, F.G.S.

Librarian and Curator of Museum :

Mr. GEORGE PENROSE.

Mr. Thurstan Peter proposed the adoption of the Report. He asked any ladies and gentlemen who had valuable manuscripts to kindly submit them to the Institution that they might be copied and printed in the Journal. Within the past few weeks he had had handed him the original notes and plan which had been made by Mr. William Mitchell, of Comprigney, when he first excavated old Perran Church. He had also received during the past week or two some manor rolls dated from the time of Henry VI. to the present day, and the amount of light thrown by them on the history of Cornwall was simply marvellous. There must be hundreds of such old documents in the county, and if only they were brought to light and offered to the Institution a valuable contribution would be made to the history of the county. They had had a very enjoyable time under Sir Robert Harvey, and he did not think they could recall any president who had acted in a more generous and kind-hearted manner than Sir Robert. (Applause.) Those who knew his successor would, he thought, have every confidence that he, too, possessed all those characteristics, and would not allow himself to be outstripped by his predecessor. He looked forward to a successful time for those who would have the pleasure of serving under Sir Edwin's presidency. (Applause.) He proposed the adoption of the Report, and that the thanks of the Society be given to the officers for their attention to the interests of the association during the year.

Mr. J. D. Enys, in seconding, wished to endorse all that Mr. Peter had said about old manuscripts. He was himself trying to get a picture of the old Cavalry Barracks of Truro, which stood on the site now occupied by Strangways Terrace. They had to thank Sir Robert Harvey for having gone to the expense of restoring the portrait by Sir Godfrey Kneller of Anthony Payne, the Cornish giant. Thanks to Sir Robert, who undertook the remuneration of Mr. Rollason, to whom it had been a labour of love, the portrait was now in a splendid condition.

The resolution was then carried.

Sir Robert Harvey then asked Sir Edwin Durning-Lawrence to occupy the president's chair.

Sir Edwin Durning-Lawrence, cordially received, said he esteemed it a great honour to have been elected president of

such an Institution. He felt proud that during the past year a Cornishman, Mr. Rashleigh, had sold to the Institution one of the most splendid collections of minerals ever got together. He should be only too pleased if, during his term of office, there were even greater additions to the Institution than during Sir Robert's presidency. (Applause).

Dr. Clark made some interesting remarks on the distribution and migration of birds in Cornwall, and these are embodied in the paper printed below. Other papers were read by Mr. F. H. Davey on the Flora of the county, by Mr. Rupert Vallentin on the Fauna of the Isles of Scilly (written by himself and Mr. E. T. Browne), by Mr. Rollason on Kneller's portrait of Payne, and by Mr. J. H. Collins on "The Precious Metals in the West of England" These papers are all included in this number of the Journal.

A vote of thanks to the gentlemen who had read papers and to the donors to the Museum and Library was proposed by Mr. Robert Fox, seconded by the Rev. W. E. Graves, and carried unanimously.

Sir John Alleyne moved a vote of thanks to the President for presiding, which was seconded by the Mayor of Truro (Councillor J. J. Smith), and carried with acclamation.

The President briefly acknowledged the compliment and closed the meeting.

GIFTS TO THE MUSEUM.

The Rashleigh Collection of Minerals	... ..	} Obtained by purchase, the major part of the money having been given and collected by Mr. J. D. Enys.
Copy (in Water Colors) of J. Opies Portrait of the late Philip Rashleigh, founder of the Rashleigh Collection of Minerals	... ..
Two hundred cases of British Birds and Mammals collected by the late Sir Charles Graves-Sawle, Bart.	... ..	} Col. Sir Francis Graves-Sawle, Bart., C.V.O.
Common Bittern, shot at Killiow	... ..
Cormorant	... ..	} Mr. J. C. Daubuz.
Montagu's Harrier shot at Lanarth	... ..
Puffin taken at Ailsa Craig	... ..	Mr. P. D. Williams.
		Rev.H. Holroyd Mills

Case of 10 Cornish Wagtails (5 species).	} Mr. J. D. Enys.
Specimens of following minerals :—Enysite, Jade, Krokydolite, and Cairngorm Quartz.	
Whip made of Rhinoceros Hide, brought from Egypt in 1858	
Autograph letter of Richard Trevithick	
Specimen of Native Bismuth from Mexico and Cylindrite from Bolivia	} Dr. R. Pearce.
Collections of Shells, Fish, and Models of Fishing Boats	
Tail of the Lyre-bird from Australia	} Cornwall C. C. Fisheries Committee
Specimen of the Sea Horse (Hippocampus anti-quorum) from Auckland	
Cloak made of Palm Tree Leaves, probably from South Sea Islands	} Mr. W. F. Radmore.
Series of Fishing Appliances from South Sea Islands	
Crystal of Barytes from Cumberland	} Mr. H. H. Share, R.N.
Molybdenite from New South Wales	
Trevail Token	} Miss Patey.
Portrait of himself	
Do.	} Mr. T. L. Dorrington.
Do.	
Do.	} Mr. Upfield Green.
Do.	
Do.	} Mr. T. C. Peter.
Do.	
Do.	} Mr. S. Ivanus Trevail.
Do.	
Do.	} Sir Robt. Harvey.
Do.	
Do.	} Mr. J. C. Williams.
Do.	
Do.	} Rev. S. Baring-Gould.
Do.	
Do.	} Rt. Hon. L. H. Courtney.
Do.	
Do.	} Dr. R. Pearce.
Do.	
Portrait of Professor Plattner	} Major Parkyn, F.G.S.
Do.	

OBTAINED BY EXCHANGE.

Fine Crystallized Specimen of Wolfram, from Wheal Agar Mine, Cornwall.

GIFTS TO THE LIBRARY.

Day's "British Fishes;" Catalogue of British Echinoderms; Cunningham's "Treatise on the Sole;" Lister's "Mycetozoa;" Fisheries of the Adriatic; Oysters and all about them; The Sea Fisherman; Lectures on Fisheries; 15 vols., U.S.A. Fishery Reports; Amphipodous Crustacea; Papers on Ostracoda and Foraminifera	} Cornwall County Council Fisheries Committee.
Evans' "Stone Implements of Great Britain;" "British Barrows," by Greenwell & Rolleston; Jacob's Peerage (3 vols.)	

Mr. T. C. Peter.

Glasney Collegiate Church	Major Parkyn, F.G.S.
British Association Report for 1902	} Mr. J. D. Enys.
Journal and Proceedings of the Royal Colonial Institute	
Sketches at Carnac	
Journal Royal Geographical Society	Canon A. P. Moor.
19th Annual Report Bureau of American Ethnology	Mr. T. V. Keam.
Architectural History of St. Germans Church ...	} Rev. Prebendary Hingeston-Randolph
Notes on the Lead-bearing Lodes in the West of England	
Records of the London and West Country Chamber of Mines	} Mr. J. H. Collins, F.G.S.

BOOKS PURCHASED.

Ray Society. Monograph of British Coccidæ. Vol. 2.
 " " " Tyroglyphidæ. Vol. 2.
 Paleontographical Society, Monographs.
 History of St. Austell. Canon Joseph Hammond.
 Stories of some English Shires. Dr. Creighton.
 System of Mineralogy. Dana.
 The French Stonehenge. T. C. Worsfold.
 The Dolmens of Ireland. W. C. Borlase (3 Vols.)
 Nature.
 Zoologist.
 Knowledge.
 British Rainfall.
 Symon's Meteorological Magazine.

EXCHANGES WITH OTHER SOCIETIES.

Academy of Natural Sciences of Philadelphia ...	Philadelphia.
Australian, South, School of Mines	Adelaide.
Anthropological Institute of Great Britain and Ireland	} London.
Antiquary	
Bath Natural History and Antiquarian Field Club	Bath.
Belfast Naturalists' Field Club	Belfast.
Berwickshire Naturalists' Club	Cockburnspath.
Birmingham Natural History and Philosophical Society	} Birmingham.
Boston Society of Natural History	
	Boston, U.S.A.

Bristol and Gloucester Archæological Society	...	Gloucester.
Bristol Naturalists' Society	... ..	Bristol.
British and American Archæological Society of Rome	... ..	} Rome.
Bulletin National Museum, U.S.A.	... ..
Bulletin Geological Survey, U.S.A.	... ..	Washington, D.C.
Bulletin Comité Géologique de St. Petersburg	...	St. Petersburg.
Cambrian Archæological Society	.. ...	London.
Canadian Institute	... ..	Toronto.
Colonial Museum of New Zealand	... ..	} Wellington, New Zealand.
Colorado Scientific Society	... ..
Cumberland and Westmoreland Association for the Advancement of Literature and Science	... ..	} Carlisle.
Department of Mines and Agriculture	... ..
Devonshire Association	... ..	Tiverton.
Eastbourne Natural History Society	... ..	Eastbourne.
Elisha Mitchell Scientific Society	... ..	Chapel Hill, U.S.A.
Essex Field Club	... ..	Stratford.
Geologists' Association	... ..	London.
Geological Society of Edinburgh	... ..	Edinburgh.
Geological Society of Glasgow	... ..	Glasgow.
Geological Society of London	... ..	London.
Greenwich Observatory	... ..	Greenwich.
Geographical Society of Australia	... ..	Adelaide.
Leeds Literary and Philosophical Society	.. ...	Leeds.
Liverpool Literary and Philosophical Society	... ..	Liverpool.
Liverpool Engineering Society	... ..	Liverpool.
Liverpool Naturalists' Field Club	... ..	Liverpool.
London and Middlesex Archæological Society	... ..	London.
Lloyd's Museum and Library	... ..	Cincinnati, O.
Manchester Geological Society	.. ...	Manchester.
Meriden Scientific Society	... ..	Meriden, Con. U.S.A.
Mineralogical Society of Great Britain	... ..	Cambridge.
Missouri Botanical Gardens	... ..	Missouri, U.S.A.
Natural History Society of Glasgow	... ..	Glasgow.
New York Academy of Sciences	... ..	New York.
North of England Institute of Mining and Mechanical Engineers	... ..	} Newcastle-upon-Tyne.
Nova Scotian Institute of Natural Science...	... ..
		Halifax, Nova Scotia

Ohio State University	Columbus, U.S.A.
Penzance Natural History and Antiquarian Society	Penzance.
Philosophical Society of Glasgow	Glasgow.
Plymouth Institution	Plymouth.
Powys-land Club	Welshpool.
Quekett Microscopical Club	London.
Rochester Academy of Science	} Rochester, New York U.S.A.
Royal Astronomical Society ... ..		London.
Royal Cornwall Polytechnic Society	Falmouth.
Royal Dublin Society	Dublin.
Royal Society of South Australia	Adelaide.
Royal Geological Society of Cornwall	Penzance.
Royal Society of Antiquaries of Ireland	Dublin.
Royal Institution of Great Britain	London.
Royal Irish Academy	Dublin.
Royal Physical Society of Edinburgh	Edinburgh.
Royal Society of Edinburgh	Edinburgh.
Smithsonian Institution	Washington.
Society of Antiquaries, London	London.
Society of Arts	London.
Surrey Archæological Society	Guildford.
Société Mineralogique de France	Paris.
Société Polymathique du Morbihan	Vannes.
Société Archéologique du Finistère	Finistère.
Somersetshire Archæological and Natural History Society	} Taunton.
Sussex Archæological Society ... ..		Lewes.
Upsala Geological Institution	Upsala.
Victorian Year Book	Westminster, S.W.
Wagner Free Institute of Science	Philadelphia.
Western Australia Year Book	Perth, W. Australia.
Y Cymmrodorian Society	London.
Yorkshire Geological and Polytechnic Society	Halifax.

BALANCE SHEET OF ACCOUNTS.

Dr. Arthur P. Dix, Esq., in account with the Royal Institution of Cornwall. Cr.

1902.		1903.		1903.				
July 31.	To Balance	£	s.	d.	By Curator	£	s.	d.
	...	4	4	3	...	75	0	0
July 31.	Subscriptions ...	162	7	0	...	5	5	0
1903.	H.R.H. Prince of Wales ...	20	0	0	Structural Alterations to buildings ...	203	12	10
July 31.	Visitors ...	7	15	0	Repairs ...	5	12	7
	Journals ...	12	6	9	Towards purchase of Rashleigh } Collection of Minerals }	500	0	0
	Henwood Medal Fund ...	19	19	0	Cost of Removal do. ...	24	1	0
	Deposit Account and Interest ...	784	16	9	Books, Printing, &c. ...	15	3	8
	Extension Fund ...	34	5	5	Fuel and Gas ...	12	7	3
	Discount ...	0	0	4	Rates and Taxes ...	2	11	7
					Insurances ...	4	14	0
					Caretaker ...	7	2	0
					Journal No. 48 ...	110	0	3
					New Cases ...	38	15	0
					Restoration of Portraits ...	8	16	0
					Sundries ...	13	4	8
					Balance ...	19	8	8
	Balance ...	19	8	8		1,045	14	6
						1,045	14	6

Summary of Meteorological Observations at Truro, in Lat. 50° 17' N., Long. 5° 4' W., for the year 1903, from Registers kept at the Royal Institution of Cornwall, by the Curator, Mr. Geo. Penrose.

MONTHLY MEANS OF THE BAROMETER. Cistern 43 feet above mean sea level.

1903.	Month.	Mean pressure corrected to 32 deg. Fahr. at sea level.		Mean of monthly means.	Mean correction for diurnal range.	True mean of monthly means.	Mean force of vapour.	Mean pressure of dry air.	Corrected absolute maximum observed.	Day.	Corrected absolute minimum observed.	Day.	Extreme range for the month.	Mean diurnal range.	Greatest range from 9 a.m. to 9 p.m.	Day.	Greatest range in any 24 consecutive hours.	Between which days it occurred.
		9 a.m.	3 p.m.																9 p.m.
		ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.		ins.		ins.	ins.	ins.		in.	
	January	29.984	29.955	29.967	.004	29.964	.265	29.703	30.500	29	29.190	9	1.130	.119	.59	31	.41	11 & 12
	February	30.192	30.168	30.187	.003	30.179	.287	29.895	30.686	10	29.467	1	1.219	.130	.36	28	.85	1 & 2
	March	29.864	29.874	29.927	.007	29.881	.287	29.601	30.460	8	29.000	2	1.460	.132	.46	3	.69	1 & 2
	April	29.972	29.948	29.953	.004	29.953	.243	29.714	30.494	18	29.313	27	1.181	.071	.24	20	.49	19 & 20
	May	29.881	29.882	29.895	.003	29.883	.323	29.563	30.371	23	29.260	4	1.111	.090	.32	2	.38	15 & 16
	June	30.053	30.056	30.055	.001	30.053	.361	29.693	30.344	4	29.555	19	0.789	.061	.16	2	.53	19 & 20
	July	29.989	29.978	30.021	.002	29.994	.424	29.572	30.376	9	29.538	17	0.738	.082	.23	25	.40	1 & 2
	August	29.916	29.922	29.928	.004	29.918	.421	29.501	30.316	6	29.253	14	1.033	.108	.34	15	.69	13 & 14
	September	30.024	30.005	30.017	.004	30.011	.419	29.596	30.543	15	29.681	29	0.862	.122	.57	10	.65	13 & 14
	October	29.678	29.708	29.695	.006	29.687	.348	29.345	30.184	17	28.935	12	1.249	.130	.33	10	.45	23 & 24
	November	30.142	30.122	30.127	.004	30.126	.298	29.832	30.547	5	29.280	29	1.267	.087	.27	13	.37	13 & 14
	December	29.718	29.703	29.720	.003	29.710	.234	29.479	30.170	21	28.976	12	1.194	.103	.37	3	.52	3 & 4
	Means	29.951	29.943	29.957	.004	29.947	.325	29.957	30.415		29.289		1.102	.102	.35		.53	

REMARKS.—The Barometer used is a Standard, made by Barrow, and compared with the Standard Barometer at the Royal Observatory, Greenwich, by Mr. Glaisher. The corrections for Index Error (+0.008), Capillarity (+0.108), height above sea (43 feet), and temperature, have been applied.

TABLE No 2.

1903.	MONTHLY MEANS OF THE THERMOMETER.												MASON'S HYGROMETER.				SELF REGISTERING.						ABSOLUTE.						
	9 a.m.		3 p.m.		9 p.m.		Mean of Dry Bulb.	Mean correction for diurnal range.	True mean of Dry Bulb.	Mean of Wet Bulb.	Mean correction for diurnal range.	Mean temp. of evaporation.	Wet Therm. below dry.	Mean dew point.	Dew point below Dry Therm.	Mean of all the Maxima.	Mean of all the Minima.	Approximate mean temp.	Correction for the month.	Adopted mean temp.	Daily mean range.	Maximum.	Day.	Minimum.	Day.	Range.			
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.																					Mean of Dry Bulb.	Mean correction for diurnal range.	True mean of Dry Bulb.
January	44.8	43.5	47.0	45.0	44.3	43.1	0	44.9	43.8	0.3	43.5	1.4	41.8	3.1	49.2	39.9	44.2	0	0	44.1	8.7	55	18	0	25	13	0	30	
February	47.6	46.0	49.0	46.9	45.6	44.0	47.4	46.7	45.6	0.5	45.1	1.6	43.9	2.8	51.7	42.0	46.8	0.1	46.7	9.7	56	13	30	14	26	13	30	26	
March ...	48.4	46.2	49.6	46.7	45.2	44.1	47.7	46.7	45.6	0.6	45.0	1.7	43.9	2.8	52.7	41.7	47.2	0.2	47.0	11.0	61	22	33	11	28	33	11	28	
April ...	49.7	45.6	50.4	46.7	43.7	42.3	47.9	46.3	44.8	1.3	43.5	2.8	39.6	6.7	54.7	38.9	46.8	0.1	46.7	15.8	63	10	26	19	37	26	19	37	
May	56.0	52.2	58.2	54.0	52.9	49.6	55.7	53.4	51.9	1.4	50.5	2.9	47.0	6.4	61.4	44.8	53.1	0.8	52.3	16.9	74	26	34	13	40	26	34	13	40
June	58.2	54.4	60.8	56.6	53.1	52.2	57.3	54.6	54.4	1.7	52.7	1.9	50.0	4.6	63.7	49.5	56.6	0.3	56.3	14.2	74	27	43	21	31	27	43	21	31
July	63.5	59.2	66.1	61.1	57.3	56.3	62.3	60.2	58.8	1.2	57.6	2.6	54.4	5.8	69.4	53.7	61.5	0.3	61.2	15.7	82	10	41	14	41	10	41	14	41
August ...	61.3	57.6	63.3	59.2	56.2	55.3	60.2	58.2	57.3	1.2	56.1	2.1	54.2	4.0	66.1	52.7	59.4	0.3	59.1	13.4	72	6	41	22	31	6	41	22	31
September	58.9	56.0	61.3	57.7	55.0	54.1	58.1	56.4	55.9	0.9	55.0	1.4	54.1	2.3	64.3	51.3	57.8	0.2	57.6	12.9	71	1	34	15	37	1	34	15	37
October	55.3	52.9	55.9	53.2	52.1	51.1	54.4	53.6	52.4	0.6	51.8	1.8	49.0	4.6	58.1	48.5	53.3	0.4	52.9	9.6	64	3	38	28	26	3	38	28	26
November	49.0	46.8	50.7	47.9	45.8	45.1	48.5	47.9	46.6	0.5	46.1	1.8	44.9	3.0	53.0	42.3	47.6	0.1	47.5	10.7	59	1	26	19	33	1	26	19	33
December	43.2	41.7	45.0	43.2	41.8	40.8	43.3	43.1	41.9	0.3	41.6	1.5	38.6	4.5	47.3	37.5	42.4	0.2	42.2	9.7	53	9	25	1	28	9	25	1	28
Means ...	52.9	50.1	54.7	51.5	49.2	48.1	52.3	51.0	49.9	0.9	49.0	1.9	46.7	4.2	57.6	45.2	51.4	0.3	51.1	12.3	65				33				33

The Thermometers are placed on the leaded roof of the Royal Institution in a wooden shed, through which the air passes freely. The Standard wet and Dry Bulbs are by Negretti and Zambra, with Kew Certificates.

TABLE No. 3.

1903.	Month.	WINDS.												AVERAGE FORCE.																							
		E.			S.E.			S.			S.W.			W.			N.W.			N.			N.E.														
		9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.												
	January	1	2	0	6	5	2	4	8	9	11	3	4	4	1	1	0	2	2	3	16	15	12	15	15	12	15										
	February	0	0	0	4	3	4	4	4	4	9	6	4	2	3	5	1	3	0	0	17	14	11	14	14	11	14										
	March ...	0	0	0	2	2	2	2	7	4	5	7	7	5	6	8	2	1	0	0	20	15	12	16	15	12	16										
	April ...	0	0	0	3	5	1	2	3	0	0	4	4	2	7	8	6	7	8	4	14	15	06	12	14	15	06										
	May ...	5	3	1	7	7	3	2	4	5	2	1	2	0	4	3	1	3	2	1	10	12	48	09	10	12	48										
	June	5	4	2	8	9	3	0	0	0	0	1	1	1	4	7	2	9	6	2	12	11	53	09	12	11	53										
	July	1	1	0	5	3	1	2	2	2	1	2	3	5	15	16	4	0	0	0	12	11	54	09	12	11	54										
	August ...	0	1	0	3	3	2	4	3	6	7	9	12	6	9	6	2	0	0	0	13	11	09	11	14	14	09	12									
	September	6	5	2	7	8	4	2	3	4	4	4	3	1	4	2	2	1	2	0	14	14	09	12	14	14	09	12									
	October ...	0	0	0	1	1	0	9	7	9	6	6	8	6	5	7	2	1	0	0	17	15	10	14	13	13	09	12									
	November	1	1	0	2	2	0	2	3	4	2	4	5	4	11	9	5	5	7	1	13	13	09	12	14	14	09	12									
	December	7	9	5	4	3	1	2	3	2	0	1	3	2	6	5	3	1	3	3	12	14	09	12	14	14	09	12									
	Total ...	26	26	10	52	51	23	46	47	48	47	48	46	38	75	77	30	33	34	13	170	160	102	115	170	160	102	115									
	Means ...	30.6			43.0			43.3			47.3			44.0			60.6			29.0			11.0			1.4			1.3			0.8			1.2		

The force of the Wind is estimated on a scale from 0 to 6, from calm to violent storm.

TABLE No. 4.

1903.	WEATHER.																															
	Month.	AVERAGE CLOUDINESS.				RAINFALL.				Mean weight of vapour in a cubic foot of air.	Mean additional weight required for saturation of the air.	Mean humidity of atmosphere.	Mean elastic force of vapour.	Mean weight in grains of a cubic foot of air.	Total hours of Bright Sunshine.	No of Days on which the sun shone.	Average Daily sunshine.	Dry.	Wet.	REMARKS.												
		9 a.m.		3 p.m.		9 p.m.		Mean.													Rainfall in inches.		Greatest fall in 24 hours.		Truro.		No. of days on which rain fell.		Truro.		Date.	
		9 a.m.	3 p.m.	9 p.m.	Mean.	ins.	Truro.	ins.	Truro.												ins.	Truro.	ins.	Truro.	ins.	Truro.	ins.	Truro.	ins.	Truro.	ins.	Truro.
January	8.1	8.5	6.4	6.8	5.23	23	.98	4	3.0	0.3	.92	.265	533.1	48.8	15	1.5	72	21	Gale, 5, 15, 16, 26, 31. Snow, 11. Hail, 3. Frost, 1, 12, 13, 14, 15, 18. Fog, 1, 13. Violent Gale, 26. Sleet, 1. Hail, 1, 23, 25, 28. Frost, 14. Fog, 13, 20. Thunder and Lightning, 25. Rain contained dust of a yellowish colour in suspension, 22.													
February	7.3	8.2	7.0	7.5	1.87	18	.42	26	3.3	0.3	.93	.287	530.9	65.3	14	2.3	69	15	Gale, 2, 23, 24, 28, 29. Hail, 1, 16.													
March ...	6.6	6.7	6.9	6.7	5.90	26	.82	13	3.3	0.3	.93	.287	530.9	149.9	28	4.8	70	23	Hail, 13. Frost, 14, 17, 18, 19, 20.													
April	5.7	5.2	3.2	4.7	1.72	11	.58	30	2.8	0.8	.79	.244	531.2	179.9	28	5.9	79	11	Hail, 10. Thunder, 10, 28.													
May	5.4	5.2	4.7	5.1	2.63	15	.78	2	3.6	0.9	.80	.322	523.4	225.6	29	7.2	80	13	Hail, 9, 14. Thunder & Lightning, 9. Lunar Halo, 8.													
June	6.7	4.8	5.1	5.5	2.24	12	1.05	9	4.1	0.6	.86	.360	522.1	216.0	25	7.2	78	12	Thunder and Lightning, 12.													
July	4.9	3.9	3.1	4.0	3.99	18	.68	27	4.7	1.1	.82	.423	515.7	237.5	30	7.6	82	11	Gale, 15. Lightning, 15. Fog, 25, 31. Remarkable Rain, 18.													
August ...	6.5	6.7	5.9	6.3	4.84	19	1.42	13	4.7	0.7	.87	.421	517.8	194.2	26	6.2	78	15	Gale, 8, 10, 20. Thunder and Lightning, 23.													
September	6.1	6.0	5.2	5.8	3.55	17	.78	1	4.7	0.3	.93	.419	519.8	179.4	27	5.9	75	15	Gale, 6, 12, 13, 25. Hail, 15. Thunder and Lightning, 15, 22. Remarkable Rain, 11, 14. Violent Storm, 27. Gale, 21, 27, 28. Snow, 24, 30. Frost, 14, 23. Hail, 5, 6, 7, 11, 12, 28. Gale, 12, 27. Hail, 5, 6, 7, 11, 12, 28. Frost, 1, 2, 3, 12, 26, 27, 28, 29, 30. Fog, 17, 23, 25, 26. Remarkable Rain, 12.													
October ...	7.0	6.9	6.3	6.7	8.90	29	1.16	14	3.9	0.6	.86	.347	523.3	108.3	23	3.5	66	27														
November	6.3	6.8	5.2	6.1	2.81	22	.48	26	3.4	0.3	.93	.298	529.7	76.5	23	2.5	77	13														
December	7.2	7.5	7.3	7.3	8.43	20	2.13	12	2.7	0.5	.84	.234	534.4	50.3	18	1.6	66	27														
Means ...	6.4	6.3	5.5	6.0	52.11	230*			3.6	0.5	.87	.325	526.0	173.7*	286*	4.7	74	17														

* Totals. Cloudiness is estimated by dividing the sky into ten parts, and noting how many of these are obscured. The sunshine is taken by a Jordan's Photographic Sunshine Recorder, presented by J. D. Eady, Esq., F.R.S. The rain gauge is placed on the flat roof of the Royal Institution, at about 40 feet from the ground.

SUMMARY OF METEOROLOGICAL OBSERVATIONS AT TREWIRGIE, REDRUTH.

Latitude 50° 13' 44" N.

By ARTHUR P. JENKIN, Esq.

Longitude 5° 13' 48" W.

1903. Month.	MASON'S HYGROMETER.				THERMOMETER ABSOLUTE.								RAINFALL.			CLOUD.		WIND.			REMARKS.	
	Mean of Dry Bulb.	Mean of Wet Bulb.	Wet Ther. below.	Mean Dew Point.	Relative humidity.	Maximum.	Day.	Minimum.	Day.	Range.	Mean of all the Maxima.	Mean of all the Minima.	Approximate mean temperature.	Monthly mean range.	Total depth.	Number of rainy days.	Greatest fall in 24 hours.	Mean amount at 9 a.m.	Relative Proportion of.	N. S. E. W.		
January ...	43.1	41.8	1.3	40.2	89	53.1	4.24.2	14.28.9	46.9	38.7	42.8	8.2	5.95	25	1.15	4	7.9	12.53	26	33	Gale 5, 15, 16. Hail 2, 3. Lightning 2. Snow 11. Fog, 17, 19. Hoar Frost, 11, 17.	
February ...	45.7	44.2	1.5	42.5	88	54.3	19.33.0	1.21.3	48.9	41.3	45.1	7.6	2.14	21	45.25	7.2	9.37	4	58	Gale 24, 26. Snow 1. Hail 1. 22. 23, 24, 25, 28. Fog, 11, 12, 22. Hoar Frost 17. Thunderstorm, 24.		
March ...	46.5	44.4	2.1	42.0	85	56.0	22.35.6	18.20.4	49.9	40.4	45.2	9.5	6.60	28	86.13	7.3	17.48	0	59	Gale, 2, 23, 24, 25, 26. Hail, 1, 6, 16, 26. Snow, 6. Thunder, 6, 22.		
April ...	47.1	43.7	3.4	39.9	76	56.1	29.31.1	18.25.0	50.4	39.8	45.1	10.6	2.85	16	1.08	30	6.9	49	15	16	40	Fog, 4, 27. Hail, 12, 13. Snow, 16.
May ...	53.8	50.1	3.7	46.5	76	67.9	27.39.0	10.28.9	58.1	45.5	51.8	12.6	3.41	14	1.07	28	5.8	41	30	31	22	Hail, 8. Thunderstorm with very heavy rain, 28. Fog, 28, 30, 31. Humidity, 43 per cent., 29th.
June ...	55.8	52.4	3.4	49.2	79	71.3	27.43.0	22.38.3	59.8	48.7	54.3	11.1	1.77	11	54.14	7.1	46.29	33	12	Thunder, 9. Fog, 24.		
July ...	61.1	57.8	3.3	54.9	80	77.3	11.46.9	13.30.4	66.0	53.0	59.5	13.0	3.98	18	64.27	6.3	41	32	10	41	Thunder, 2, 19. Thunderstorm, 12.	
August ...	59.5	56.6	2.9	54.0	82	69.1	31.45.8	22.23.3	63.6	52.3	57.9	11.3	5.19	21	1.22	13	6.9	15	51	4	54	Gale, 13, 15. Fog, 30.
September ...	58.0	55.0	3.0	52.3	82	67.3	1.40.0	16.27.3	61.5	50.8	56.1	10.7	3.44	17	96.1	6.8	21	43	21	31	Gale, 8, 10, 18, 20. Fog, 1, 25. Thunder, 26.	
October ...	53.0	51.1	1.9	49.2	87	61.5	3.38.1	29.23.4	56.2	47.8	52.0	8.4	10.00	30	1.21	14	7.2	19	50	0	55	Gale, 6, 12, 21, 23, 25. Hail, 9, 15, 16. Thunder, 15. Fog, 19, 31.
November ...	47.2	45.3	1.9	43.2	86	56.3	12.31.7	19.24.6	59.4	43.2	46.8	7.2	3.62	24	54.27	6.5	31	18	23	48	Gale, 21, 27, 28. Hoar Frost, 4, 18. Hail, 14, 16, 27, 28, 30. Snow, 29, 30.	
December ...	42.0	40.8	1.2	39.3	90	51.8	8.27.7	30.24.1	45.3	37.9	41.6	7.4	9.81	25	2.08	12	7.4	22	24	44	30	Gale, 6, 8, 12. Thunder, 1, 2, 7, 9. Hail, 5, 7, 9, 10, 26. Snow, 5, 26. Fog, 29, 23. Hoar Frost, 26.
Means	51.1	48.6	2.5	46.1	83	61.8	36.3	26.3	54.8	44.9	49.8	9.9	58.76	250	6.9	27	36	18	40	Totals.*		

* Totals.*

Readings taken at 9 a.m. local time. All instruments with Kew Certificates, and where applicable are placed in a Stevenson screen. Height above sea level from Ordnance Bench Mark, 395 feet. Top of rain gauge 1 foot above ground. Wind is calculated as follows: — N. N. W. = 2 S. S. W. = 4 W. W. S. W. = 3 W. I. S. and so forth.

COMPARISON OF RAINFALL IN THE NEIGHBOURHOOD.

1903.	J. C. DAUBUZ, Esq., Killiflow.				W. J. LEAN, Esq., Truro Water Works.				H. TRESAWNA, Esq., Lamellyn, Probus.				GEO. PENROSE, Royal Institution of Cornwall.					
	Total depth.		Greatest fall in 24 hours.		No. of days on which 'or or more fell.		Total depth.		Greatest fall in 24 hours.		No. of days on which 'or or more fell.		Total depth.		Greatest fall in 24 hours.		No. of days on which 'or or more fell.	
	Inches	Depth	Date	Inches	Depth	Date	Inches	Depth	Date	Inches	Depth	Date	Inches	Depth	Date	Inches	Depth	Date
January ...	5·28	1·08	4	23	5·10	1·19	4	21	4·60	·90	4	21	5·23	·98	4	23		
February ...	2·13	·54	26	15	2·22	·55	24	18	1·82	·42	24	13	1·87	·42	26	18		
March ..	5·86	·74	13	27	5·92	·89	13	27	5·23	·63	13	24	5·90	·82	13	26		
April ...	1·72	·57	30	10	1·89	·46	30	13	1·91	·50	30	10	1·72	·58	30	11		
May ..	3·02	·75	2	14	2·91	·88	2	17	2·49	·75	2	15	2·63	·78	2	15		
June ...	2·05	·31	14	10	2·04	·93	9	12	1·34	·44	9	9	2·24	1·05	9	12		
July ...	4·16	·65	21	17	4·08	·78	27	16	4·47	·94	25	14	3·99	·68	27	18		
August ...	5·22	1·35	13	21	4·66	1·20	13	23	4·08	·72	12	18	4·84	1·42	13	19		
September	3·63	·80	1	16	3·64	·82	1	19	3·42	·68	1	14	3·55	·78	1	17		
October ...	9·68	1·46	14	29	9·39	1·05	26	31	9·42	·90	14	30	8·90	1·16	14	29		
November	3·17	·56	28	19	2·92	·55	29	22	3·10	·70	27	17	2·81	·48	26	22		
December...	8·85	1·35	13	26	8·60	2·20	12	23	6·95	1·40	12	22	8·43	2·13	12	20		
TOTAL ...	54·77			227	53·37			242	48·83			207	52·11			230		

FURTHER CONTRIBUTIONS TO THE CORNISH FLORA.

BY FRED. HAMILTON DAVEY, F.L.S.

It is not asking too much that the publication in June, 1902, of my *Tentative List of the Flowering Plants, Ferns, &c., of Cornwall*, may be regarded as the first serious step towards the compilation of a complete Flora of the County. What had previously been accomplished in that direction was of purely local character, and was so scattered through the Transactions of our local and other scientific societies and books as to be quite beyond the reach of the ordinary worker, and more than irritating to the specialist. Moreover, up to that time a deal of unpublished and valuable information was in the possession of many enthusiastic field workers, who gladly hailed the opportunity of having it incorporated with the mass of material which I had been accumulating.

With the publication of the *Tentative List* commenced a new era in the study of the Cornish flora. Such activity, such desire to unravel the tangled skein, is without parallel in the annals of west-country science, notwithstanding that the last century witnessed many remarkable revivals of interest in our composite vegetation. Before the *List* was put into circulation, I was receiving assistance in my work from about a score of ladies and gentlemen, whose leisure has long been freely given to this particular study. To-day I am in correspondence with more than fifty equally enthusiastic coadjutors, and there is scarcely a district of any note in the whole of the county which is not being looked after by some competent observer.

As is but natural, this welcome increase of our forces has resulted in the acquisition of a wealth of new material. Hundreds of additional localities have been named for plants already recorded in my *List*; species hitherto unsuspected for Cornwall have been discovered; and, what is of prime importance to every botanist, the exact status of each plant occurring in the county, whether as a native, colonist, denizen, or alien, is being approximately defined. And not only so. Since flora is known

to be as much a geographical problem as fashion and politics, some attempt is being made to solve the why and the wherefore of certain well-defined areas of plants. It is not enough to record that the Tamar district is the haunt of *Rubi*, that the Lizard Peninsula is the region of *Leguminosæ* and *Characeæ*, and that north of the range of hills forming the backbone of the county the Naked-stalked Teesdalia (*Teesdalia nudicaulis*) and the Upright Moenchia (*Cerastium quaternellum*) are as much noted for their rarity as they are south of the backbone for their frequency. Similarly, why such plants as the Annual Knawell (*Scleranthus annuus*), the Verticillate Knot-grass (*Illecebrum verticillatum*), and the Pale-blue Toad-flax (*Linaria repens*), should attain their maximum frequency on granite soil, where such common plants as the Whitlow-grass (*Erophila vulgaris*) and the Fœtid Iris (*Iris fetidissima*) are rarely seen, are questions to which some satisfactory answers should be forthcoming, and which, with a little more patience and research, I hope we shall be able to furnish.

Among those who have been devoting special care to these and other problems in connection with our county's flora, mention must be made of Mr. Walter Barratt, who devoted nearly four months of the present year (1903) to a careful working of the Padstow district, and who, by his assiduity and keenness, has placed every student of Cornish plants under lasting obligation; Mr. R. V. Tellam, a prince among Cornish botanists, who retains all his enthusiasm and alertness; Mr. Clement Reid, F.R.S., whose exacting geological duties have not prevented him from communicating a lot of critical information; and Dr. C. C. Vigurs, than whom the Newquay district has never had a more devoted or more reliable botanist. These gentlemen have been bestowing their energies more particularly on the flora north of the county's backbone. In the "far east" Mr. W. Wise has been constantly afield adding locality to locality, and has imparted large stores of information about the plants of a district with which he is most intimately acquainted. On the south coast, Par, Pentewan and Porthpean have been under the constant notice of Miss Spettigue; Truro has a willing worker in Miss Snell; and the Falmouth district has been claiming the attention of Mr. Howard Fox, F.G.S.

A detailed account of what these and many other workers, whose services are here gratefully acknowledged, have contributed to our knowledge of one of the richest of the county floras of Great Britain during the past eighteen months, would be asking too much of the editors of the "Journal." At present, therefore, I shall restrict myself to a brief recital of a few of the more important discoveries.

1. PLANTS NEW TO CORNWALL.

Fumaria purpurea, Pugsley, *Journal of Botany*, May, 1902. Out of the confusion which has so long existed in regard to the Capreolate Fumitories of Great Britain, Mr. H. W. Pugsley (*loc. cit.*) has brought a semblance of order. In this connection it will be welcome news to Cornish botanists that, as a result of Mr. Pugsley's re-arrangement of this section, a new species is accredited to Cornwall. Under the name of *Fumaria Boræi*, Jord., it seems, two distinct plants have been included. Of the plant described by Jordan in his *Pugillus* (1852) there can be no manner of doubt; but under the same name the late Prof. Babington, in a paper before the Linnean Society in 1859, as well as subsequent writers, dealt with a plant which, no one can deny, differs in many material points from Jordan's. Mr. Pugsley has defined it very satisfactorily, and has proposed for it the name *Fumaria purpurea*. As far as has yet been ascertained, it is restricted to Great Britain and Ireland. Until I found it at Ponsanooth in September last, it had not been recorded for Cornwall, although it had been found at Ilfracombe, in the sister county. As it is more than likely to occur in other parts of Cornwall, I insert here, for the guidance of those who may not be acquainted with his valuable paper, Mr. Pugsley's diagnosis:—"Flowers rather smaller than in *F. capreolata* L. Sepals about two-thirds as long as the corolla, oblong, often obtuse and nearly entire. Corolla purplish, tipped with dark purple. Upper petal with broader wings than in *F. capreolata* L. Pedicels patent-recurved in fruit. Fruit slightly rugulose when dry, broader than long."

Dianthus prolifer, Linn. I include this tentatively among the additions to the Cornish flora on the strength of information supplied by Mr. Arthur Bennett, F.L.S. Looking through his

herbarium about twelve months ago, Mr. Bennett found specimens of this plant labelled, "Cornwall, Prof. Temperè." The specimens are without date and locality, but Mr. Bennett thinks they were gathered about the years 1875-1877, and that they most likely came from the western section of the county. Before the plant can be accepted as a genuine Cornish record, it must be re-found. I record it here only as a *possible* addition to the county, and as a hint to my co-workers to be on the look out for it. There is an old and doubtful record for it for Devon.

Silene nutans, Linn. A few plants were found by Mr. Tellam last summer among other introductions at Par. For this also there is a much disputed Devon record.

Lychnis dioica x *alba*. Hybrids of the two species were found at the Lizard Town, in 1902, by Mr. F. T. Richards, and at Falmouth Docks by myself during the past summer. They are strikingly showy plants, prolific in flowers of a delicate pinkish-white colour.

Malope malacoides, Linn. In 1902 a single plant of this alien was discovered by Mr. Clement Reid on a roadside wall west of Newquay, away from houses and gardens. It flowered again last summer, but Mr. Reid was unable to report the ripening of fruits.

Medicago lappacea, Lam. Of the more recent arrivals at Falmouth from foreign lands, this is an interesting example. It covered a good many yards of the eastern portion of the Docks last summer, and ripened quite an alarming number of its spinous burrs. One may safely predict that, like *Matricaria discoidea*, another wanderer from foreign lands, it has come to stay.

Geum rivale x *urbanum* (*intermedium*, Ehrh.) Several plants in a hedge-bank in Underlane, St. Thomas, Launceston; growing near both parents, 1902, *W. Wise*.

Sedum rupestre, Linn. In her interesting book, *Rambles in search of Wild Flowers*, Margaret Plues records this plant for the cliffs around Looe. Mr. C. B. Allen also includes it in his list of the plants of Penzance and neighbourhood, published in the *Annual Report* of the Royal Cornwall Polytechnic Society for 1871. After spending the summer of 1900 at Looe, I was able to show that Miss Plues had mistaken *Sedum reflexum* for *S.*

rupestre; and as the late Dr. Ralfs never accepted Mr. Allen's record, it is pretty clear that at the time of publication of my *List S. rupestre* was not known to occur in Cornwall. I am now able to offer three localities for it. At Ponsanooth, where for some unaccountable reason I had previously overlooked it, it occupies quite fifty yards of a wayside hedge. I have also found it near Hicks' Mill, in the parish of Gwennap, and *Miss Eyre* has been able to show me another locality for it near St. Agnes village.

Caucalis arvensis, Huds. I include this species on the strength of the record in *Topographical Botany* (1883), where specimens are said to have been forwarded to Mr. H. C. Watson from East Cornwall by *Mr. Hart Smith*.

Achillea nobilis, Linn. Previously phenomenally rich in aliens, many of which have obtained a permanent hold of the district, Par, in 1902, gave the county a good record for this plant. *Miss Davey* found and directed me to a large and thriving colony, which has considerably extended its borders since.

Carthamus lanatus, Linn. Another alien which was frequent on the dumping ground near the new gardens, between Truro and Malpas, in 1902.

Lactuca muralis, Fresen. This plant is here included on the authority of the entry in *Topographical Botany*—"East or West Cornwall, *G. S. Gibson*." Workers should keep a look out for it.

Phacelia crenulata, Torr. An alien occurring sparingly at Par, 1902, where it was discovered by *Miss Davey*.

Pulmonaria officinalis, Linn. On a hedge-bank in a lane leading from Dunheved Cross to Badash farm; quite established, *W. Wise*.

Nicotiana rustica, Linn. A number of exceptionally fine specimens were found at Par, with other aliens in 1902 and 1903, by *Mr. Tellam*. Fruit was ripened in abundance.

Salvia verticillata, Linn. The records for this plant are:—Launceston, *W. Wise*; Par, *F. H. Davey*; Malpas, *Miss Snell*.

Orchis latifolia x *maculata*. Hybrids of these two species occur in the Trewedna Valley, in the parish of Perran-ar-worthal.

Now attention has been directed to them they will doubtless be found in other parts of the county. The plants have the solid stems and spreading leaves of *O. maculata*, and the large flowers of *O. latifolia*.

Eleocharis uniglumis, Reichb. This is an interesting addition to the indigenous flora of the Scilly Isles. It is wanting from the mainland of Cornwall, and, unless there is a recent record, is unknown for Devon. In the herbarium of Mr. Bennett, referred to *ante*, there are specimens labelled—"Higher Moor, St. Mary's, and by the pond near the mill, Tresco, Scilly Isles, May 26, 1876, W. Curnow." Mr. Bennett informs me that Mr. Curnow labelled the plants *Scirpus pauciflorus*, and that Mr. H. C. Watson, the author of *Topographical Botany*, added as a note—"I think this is *S. uniglumis*, but do not feel very confident. My eyes become too aged and dim for examining minute characters, especially in dull winter days." Mr. Bennett adds—"There is no doubt they are *uniglumis*; hence an addition to your *List*."

Agrostis interrupta, Beauv. Found as a casual on Penzance beach by Mr. F. T. Richards.

Glyceria Borreri, Bab. By the discovery of this grass Mr. Tellam has brought Cornwall into line with Devon. He has found it in fair abundance in littoral marshes, near Clapper, Egloshayle, and Polmorrow, Wadebridge. In many respects it ranks as the discovery of the year, as, whatever may be said for the indigeneity of some of the other additions, there can be no doubt about this. Mr. G. C. Druce, F.L.S., and Prof. Hackel have both made a definite pronouncement on the grass.

Melica nutans, Linn. Dr. Clark has discovered this local and badly understood grass in the Gorran district, where it appears to be restricted to a small spot by the roadside. There is an old and very unreliable record for it for Devon, consequently its occurrence in Cornwall came as a great surprise.

Bromus tectorum, Linn. Occurring freely at Falmouth Docks last summer, this casual is not only an addition to the flora of a very rich district, but is likewise new to the county. It may be distinguished from *B. madritensis*, its nearest ally, by its secund panicle and horizontal spikelets.

2. VARIETIES NEW TO CORNWALL.

Whatever may be the extent of our sympathies with botanical "splitters," we cannot ignore the fact that they are with us and more likely than ever to remain; and since detailed reference is being made in all County Floras to varieties of plants, it is seemly that some notice should be here made of some of the more interesting varieties which have recently been added to the flora of Cornwall.

Fumaria Borca, Jord., var. *serotina*, Cl.=*F. muralis*, Sond. ap. auct. angl. (ex parte). Lane near Rialton, St. Columb Minor, *Clement Reid*.

Cardamine pratensis, Linn., var. *palustris*, Petern. Rialton, and elsewhere, St. Columb Minor, *C. C. Vigurs*. "This is a plant with pinnate radical leaves, with three pairs of distinctly stalked cordate leaflets, and usually lilac flowers... The true *C. pratensis*... has radical leaves with five to eight pairs of sessile leaflets, which are rounded at the base but not cordately emarginate, and the flowers are usually white," Druce, *Flora of Berkshire*.

Geranium Robertianum, Linn., var. *modestum* (Jord.). St. Minver and Wadebridge, *R. V. Tellam*. Padstow, *W. Barratt*. Crantock, *Clement Reid*. Mr. Reid, who has been engaged on a critical study of the Cornish forms of *G. Robertianum*, tells me that the variety *modestum* has characteristic yellow anthers.

Callitriche hamulata, Kuetz, var. *pedunculata* (DC.) This form, in which the fruit is often considerably stalked, affects shallow, muddy pools, especially such as are periodically disturbed by the operations of man, or by the treading of cattle. *Mr. Reid* first recorded it from Trefullock Moor, in the parish of St. Enoder, and from Park of Mines, near St. Columb Road Station. Subsequently *Mr. Barratt* detected it on Crackrattle Moor, Denzell Down, in the parish of Newlyn East, and about the same time I discovered it in a wayside pool at Greensplat, in the parish of Gwennap.

Carduus crispus, Linn., var. *polyanthemos* (Koch). Par, 1903, *R. V. Tellam*.

Mentha gentilis, Linn., var. *Wirtgeniana* (F. Schultz). Roadside brook, near Camelford, *C. C. Vigurs*.

Atriplex littoralis, Linn., var. *serrata*, Moq. Par, 1903, *Miss Spettigue*.

Schœnus nigricans, Linn., var. *recurvus*, Curnow. This varietal name was proposed by the late Mr. W. Curnow for a striking plant found with the type on Lizard Downs, 1877, and of which good specimens are in the herbarium of Mr. A. Bennett. Mr. Bennett writes:—"This is a very odd form of the species. It is about six inches high, and grows just like some ferns come up, *i.e.* with considerable curving of the stem. It is not the same as Beeby's variety *nana* (See "Flora of Shetland," in *Scott. Nat.*, p. 207, 1887), specimens of which I possess. I think it may well bear Curnow's name, but I think it is really only a form, although I must admit I see no evidence of insect or fungus agency to cause it. The specimens are as healthy as others, and if they occurred with the normal form, wind would not account for them."

Carex Goodenowii, J. Gay, var. *juncella* (T. M. Fries). This, gathered in the Camborne Waterworks, Crowan, was identified for me by Mr. Bennett.

C. flacca, Schreb., var. *Micheliana*, Ar. Benn. Tregordon, near Egloshayle, *R. V. Tellam*.

Poa nemoralis, Linn., var. *coarctata* (Gaud.). Top of a wall at Wadebridge, *R. V. Tellam*.

Festuca ovina, Linn., var. *capillata*, Hackel. Near Bodmin, *R. V. Tellam*.

Lepturus filiformis, Trin., var. *incurvatus* (Trin.). Another of *Mr. Tellam's* records, and in its own way perhaps not less interesting than his discovery of *Glyceria Borreri*. It occurs in a marsh near Egloshayle. Formerly occupying specific rank, it was for a time excluded the British Flora, as grave doubts were attached to its indigeneity.

3. Additional Records for some of the Rarer Plants.

Ranunculus trichophyllus, Chaix. Stream near Rock, St. Minver; ditch near St. Merryn Post Office; mill-stream at Porthcothan, St. Merryn; Cataclews Point, St. Enodoc; Pentruse Farm, St. Ervan, *W. Barratt*.

R. Drouetii, Godr. Ditch near Padstow Reservoir, *W. Barratt*. Pool near Harlyn Bay, St. Merryn, *R. F. Tellam*.

R. peltatus, Schrank. Chy-an-hal Moor, near Penzance, *W. Barratt*.

R. auricomus, Linn. On a hedge-bank and in the water-table by the road leading from Lowly Bridge to Rizowe, Lezant, 1903, *W. Wise*.

R. arvensis, Linn. Par, *R. F. Tellam*.

Fumaria Borœi, Jord. Padstow, *W. Barratt*. Near St. Austell, *A. O. Hume*. Hea Moor and Rosemorran, near Penzance, *A. Hosking*.

F. muralis, Sonder. Par, *Miss Spettigue*. Gulval and Love Lane, Penzance, *Mrs. E. S. Gregory*.

Erophila præcox, DC. The Rill, Kynance, *Rev. W. Moyle Rogers*. A new vice-county record.

Sisymbrium Sophia, Linn. Tram line, near Pentewan, *Rev. Canon Saltren Rogers*.

S. altissimum, Linn. Par, 1901 and 1902, *F. H. Davey*.

S. Irio, Linn. Par, 1902; Falmouth Docks, 1903; Ponsanooth, one plant, 1903, *F. H. Davey*. North side of St. John's Church, Penzance, 1902, *W. Barratt*.

Camelina sativa, Crantz. Falmouth Docks, 1903, *Howard Fox*. Near Helston, *Rev. W. Moyle Rogers*.

Lepidium rudemale, Linn. Wadebridge Quay, 1902, *Mrs. Travers Adamson*. Newquay, 1902, *C. C. Vigurs*.

L. Draba, Linn. West of Saltash Railway Station, 1902; Hicks' Mill, Gwennap, 1902, *F. H. Davey*. Illogan, 1885, *Rev. A. R. Eggar*.

Rapistrum rugosum, All. Between Truro and Malpas, 1902, *F. H. Davey*. Perranporth, 1902, *Miss Snell*.

Viola Curtisii, Forster. Stony beach near Helford Passage, *Rev. A. R. Eggar*.

Polygala oxyptera, Reichb. Langivels Crook, Little Petherick, *W. Barratt*.

Dianthus Armeria, Linn. Lamorna Cove, 1903, *Clement Reid*.

Saponaria Vaccaria, Linn. Cornfield, Ladock, *J. O. Clemmow*. Between Truro and Malpas, 1902, *F. H. Davey*. Cornfield at Tremithick Cross, near Penzance, 1902, *A. Hosking*.

Silene dichotoma, Ehrh. Bissoe, Kea, 1902, *F. H. Davey*.

Silene noctiflora, Linn. Dowlerry, *Miss Hambley*.

Stellaria palustris, Retz. Lostwithiel, 1901, *A. O. Hume*.

Hypericum montanum, Linn. Tintagel, 1902, *E. J. Schwartz*. Lizard Downs, near Kynance, 1880, *F. T. Richards*.

Melilotus indica, All. Par, 1902, *F. T. Richards*. Outskirts of a garden at Redruth, 1902, *W. N. Winn*.

Trifolium squamosum, Linn. Par, 1872, *R. V. Tellam*.

Coronilla varia, Linn. Hayle, 1903, two plants, *Mrs. Travers Adamson*.

Vicia gracilis, Loisel. Par, 1872, *R. V. Tellam*.

V. bithynica, Linn. Housel Bay, Lizard, 1902, *Mrs. Travers Adamson*.

Lathyrus Nissolia, Linn. Coastguard path between Ruan Minor and Rill Head, *Mrs. Travers Adamson*.

Rosa obtusifolia, Desv. Penrose Wood, Helston, 1873, *Rev. W. Moyle Rogers*.

Sedum album, Linn. Little Petherick, 1903, *W. Barratt*. Tresamble Lane, Gwennap, 1903, *F. H. Davey*.

Sedum sexangulare, Linn. Rock, St. Minver, *E. J. Schwartz*. A new vice-county record. Near Marazion, *F. T. Richards*.

Eryngium campestre, Linn. Poundstock, near Bude Bay, *G. C. Bignell*.

Ammi majus, Linn. Par, 1902, *F. T. Richards*.

Carum verticillatum, Koch. Northill, 1903, *J. D. Enys*.

Sison Amomum, Linn. Around Truro, *Miss Snell* and *F. H. Davey*.

Sium crectum, Huds. Marshes in Illogan Wood, *W. N. Winn*.

Caucalis daucoides, Linn. Port Isaac, 1902, *W. Barratt*. Par, 1902; Falmouth Docks, 1902 and 1903, frequent, *F. H. Davey*. Cornfield at St. Hilary, 1900, *A. Hosking*.

Lonicera Caprifolium, Linn. Penrose Woods, Helston, *Rev. W. Moyle Rogers*. A new vice-county record.

Galium uliginosum, Linn. Bargus Moor, Perran-ar-worthal, *F. H. Davey*.

G. triorne, Stokes. Par, 1902; Falmouth Docks, 1902 and 1903, *F. H. Davey*. Cadgwith and Kennack, 1902, *F. T. Richards*. The Falmouth and Lizard localities are new vice-county records.

Asperula arvensis, Linn. Falmouth Docks, 1903, *F. H. Davey*.

Valerianella carinata, Loisel. Par, 1902, *F. H. Davey*.

Inula Helenium, Linn. Pathada, Menheniot, *Miss Hammond*. Near Kennack, Kugger, *F. T. Richards*.

Matriearia Chamomilla, Linn. Withiel, Bodmin, St. Breock, *R. V. Tellam*.

Centaurea solstitialis, Linn. Par, 1902, frequent, *F. H. Davey*. Poltesco, late *J. Cunnack*, *teste F. T. Richards*.

Hieracium aurantiacum, Linn. Newlyn East Churchyard, *R. H. Wyatt*. East Wheal Rose Mine, Newlyn East, *Clement Reid*. Crantock, *C. C. Vigurs*.

Lactuca virosa, Linn. Newham, Truro, 1902, *Miss Snell*.

Tragopogon porrifolium, Linn. Rock, St. Minver, *R. V. Tellam*. Devoran, 1902, *F. H. Davey*.

Lysimachia Nummularia, Linn. Ethy Woods, near Lostwithiel, *Cornish Moneywort Club*.

Blackstonia perfoliata, Huds. Between Padstow and Harlyn Bay; Stepper Point, Padstow; Harlyn Bay; Little Petherick River, *W. Barratt*. St. Eval; Tregurrian, near Newquay, *Miss Martyn*.

Gentiana Amarella, Linn. Crantock Sandhills and Newquay Golf Links, 1903, *Miss Martyn*. Cliffs at Penhale, Perranzabuloe, 1895, *R. H. Wyatt*. Porth Towan, 1903, *Miss Snell*. Perran Round, *W. Tresidder*.

G. campestris, Linn. Northill parish, on hills and fields, abundant, *J. D. Enys*. Crantock Sandhills, near Newquay, *W. Barratt*. Goonhavern Moor, Perranzabuloe, *W. Tresidder*.

Lithospermum arvense, Linn. Falmouth Docks, 1903, *F. H. Davey*.

Amsinckia lycopsioides, Lehm. Par, 1902, frequent, *F. H. Davey*.

Echium plantagineum, Linn. Rocky field-border, a little way inland from Mullion Cove, in very small quantity, 1856 and 1857, *Rev. W. Moyle Rogers*.

Linaria supina, Desf. Newquay Waterworks, 1903, *C. C. Vigurs*. Fair quantity in an old quarry at Portreath, 1857, *Rev. W. Moyle Rogers*.

L. purpurea, Mill. Par, 1902, *F. T. Richards*.

L. repens, Mill. Near Caradon Town, Linkinhorne, *Rev. H. E. Fox*.

L. repens x *vulgaris*. Near Caradon Town, Linkinhorne, *Rev. H. E. Fox*. Near Mawgan, *Mrs. Pierson*. Near Penryn Waterworks, *Rev. A. R. Eagar*.

Mentha alopecuroides, Hull. Roadside at the bottom of Tresamble Hill, Gwennap, *F. H. Davey*. A new vice-county record.

M. gentilis, Linn., var. *Pauliana* (F. Schultz). Crantock Village, *C. C. Vigurs*. Lanner Moor, Gwennap, *F. H. Davey*.

Thymus chamædryis, Fr. Trebarwith, *Mrs. E. S. Gregory*. Roadside, Coldwind Cross, Perran-ar-worthal; roadside between Ponsanooth and Pengreep, *F. H. Davey*.

Calamintha arvensis, Lam. Coldrenick, 1903, *D. Darell*.

Galeopsis Ladanum, Linn. Camelford, *Mrs. E. S. Gregory*.

Littorella juncea, Berg. Camborne Waterworks, Crowan, *F. H. Davey*.

Rumex rupestris, Le Gall. Shore under East Pentire, Newquay; shore at Gravel Hill Mine, Cubert; Lelant; Lamorna Cove, *Clement Reid*.

Daphne Laureola, Linn. Merthen Wood, near Helston, *Rev. W. Moyle Rogers*.

Orchis incarnata, Linn. Tregordon, Egloshayle, *R. V. Tellam*. Newquay, *W. A. Clarke*. Constantine, *Howard Fox*.

Habenaria conopsea, Benth. Constantine, *Howard Fox*. Goonhavern, Perranzabuloe, *W. A. Clarke*.

Narcissus incomparabilis, Mill. Very abundant in a damp meadow between London Apprentice and Sticker, about 2½ miles from St. Austell, *Miss Spettigue*.

Allium Anaploprasum, Linn., var. *Babingtonii* (Borr.). Side of a stream near Porthcothan, St. Merryn, *W. Barratt*. Railway bank east of Hayle Signal Box, *Mrs. Travers Adamson*.

Lilium pyrenaicum, Gouan. One plant in a ditch thicket in Tresamble Lane, Gwennap, *F. H. Davey*.

Patamogeton crispus, Linn. Tremough, Mabe, *F. H. Davey*.

Ruppia rostellata, Koch. Watery ditch by footpath leading from Par Station to the village, *F. H. Davey*.

Zannichellia pedunculata, Reichb. Pool in a marsh at Lower Amble, St. Kew, 1903, *R. F. Tellam*.

Cyperus longus, Linn. Valley near Porthcothan beach, 1902, *W. Barratt*.

Elvocharis acicularis, R.Br. Camborne Waterworks, Crowan, 1903, *F. H. Davey*.

Carex acutiformis, Ehrh. Bude Canal, by the last loch near the sea, *Rev. W. Moyle Rogers, Herb. A. Bennett*.

Setaria viridis, Beauv. Mawgan-in-Pydar, *Miss Spettigue*.

Alopecurus myosuroides, Huds. Falmouth Docks, 1902, *F. H. Davey*.

Gastidium australe, Beauv. Two places near Truro Workhouse, 1903, *Miss Snell*.

Apera Spica-venti, Beauv. Par, 1873, *R. F. Tellam*. Falmouth Docks, 1903, *F. H. Davey*.

Fibichia umbellata, Koel. Close to Marazion Station, 1902; 1½ miles from Ray's locality, *A. Hosking*.

Kalera cristata, Pers. Porth and Newquay Headland, *W. A. Clarke*. Pentire Head and Rejarrah Down, *C. C. Figurs*.

Briza media, Linn. Maceporth, 1903, plentiful, *Miss Eyre*. Kennack Sands, 1902, *Rev. A. R. Eagar*.

Poa nemoralis, Linn. The Crag, Maenporth, 1903, *Miss Eyre*.

P. compressa, Linn. Wall on Egloshayle side of Wadebridge, 1903, *R. F. Tellam*.

P. Chairii, Vill. Par and Devoran, 1903, *Dr. Clark*.

Festuca arundinacea, Schreb. Maidenhair Cove, St. Minver, *W. Barratt*.

Bromus madritensis, Linn. Falmouth Docks, 1902, *F. H. Davey*. Top of hedge Chy-an-hal Moor, Penzance, late *W. A. Glasson*, teste *A. Hosking*.

B. secalinus, Linn. Polzeath, St. Minver, *R. V. Tellam*.

B. patulus, Mert. and Koch. Falmouth Docks, 1903, frequent, *F. H. Davey*.

Lolium temulentum, Linn. Falmouth Docks, 1903, frequent, *F. H. Davey*.

Cystopteris fragilis, Bernh. Looe Railway Cutting, *Cornish Moneywort Club*.

Phegopteris Dryopteris, Fee. Wood below Minster Church, Boscastle, *W. Barratt*.

Botrychium Lunaria, Sw. Field at Coldrenick, 1901, *Miss Hammond*.

Equisetum maximum, Lam. Near Coverack, 1902, *C. C. Vigurs*.

Lycopodium Selago, Linn. Withybrook, near the Cheesewring, *Cornish Moneywort Club*. Goss Moor, 1902, *Clement Reid*.

L. inundatum, Linn. Newlyn East, 1902, *Clement Reid*.

Pilularia globulifera, Linn. Camborne Waterworks, Crowan, 1903, *F. H. Davey*.

4. EXCLUSIONS.

When preparing the material for my *List*, I was fully satisfied that many of the species therein included must be made the subjects of searching criticism before they could be accepted as genuine Cornish plants. Already many of these doubtfuls have received full attention, and as a result the following must be deleted. As investigations proceed I have no doubt others must follow.

Cardamine impatiens, Linn. This species was recorded for "near Polperro," by T. Q. Couch, in the *Annual Report* of the Royal Cornwall Polytechnic Society, 1848. Mr. F. P. Pascoe and Mr. T. R. Archer Briggs marked it in their Catalogues of East Cornwall Plants, prepared for Mr. H. C. Watson, who was then engaged on his *Topographical Botany*, but I have no doubt

their records referred to Mr. Couch's. Doubt is cast on the occurrence of the plant in Cornwall in the third edition of *Topographical Botany*, (1883), and it must not be forgotten that nearly sixty years have elapsed without any verification of Couch's record.

Viola lutea, Huds. Dr. W. P. Cocks, who recorded this in the *Annual Report* of the Royal Cornwall Polytechnic Society, 1863, for "field at Trescobeas, near Falmouth," and the Rev. J. S. Tozer, on whose authority it was included in the second edition of Hooker's *British Flora* (1831), for the Land's End, were both excellent botanists, but here also we must be cautious. No one has been able to verify either record, and it is significant that the author of *Topographical Botany* entertained very serious doubts about the occurrence of the plant in Devon and Cornwall. I would suggest that *V. Curtisii*, Forster, was the plant seen in both instances, a view which is shared by the Rev. W. Moyle Rogers, F.L.S. Further evidence must be forthcoming if *V. lutea* is to be retained as a Cornish plant.

Frankenia levis, Linn. Quite an eastern counties plant, which was recorded for "an old wall at St. Michael's Mount" by Mr. Pascoe in the *Botanical Gazette*, 1850. It was originally planted, and has long been lost sight of.

Rosa mollis, Sm. The records are:—"Between Millbrook and Craffhole," Rev. John Pike Jones, in *A Botanical Tour through various parts of the counties of Devon and Cornwall* (1820), and "Fowey," Mrs. W. J. Graham, in my *List*. Mr. James Groves, F.L.S., writes:—"I think most of the southern records for this are open to doubt; specimens should be seen." From the Rev. W. Moyle Rogers I have received the following:—"Surely very doubtful; almost certainly a form of *R. tomentosa*."

Rosa sepium, Thuill, and var. *inodora* (Fr.). As this is not a west-country rose, the records for Falmouth district, by H. C. Bastian, in the *Annual Report* of the Royal Cornwall Polytechnic Society, 1856, and by E. Bullmore, in the manuscript *Flora of West Cornwall*, by the late Dr. Ralfs, must be placed under some other species, probably *R. micrantha*.

Callitriche autumnalis, Linn. Mr. James Groves' note on this is as follows:—"Most improbable. *C. lamulata* has been fre-

quently recorded for this; but *C. truncata* is quite likely to occur." Mr. Arthur Bennetts, F.L.S., comments thus:—"It is likely the plants might have been *C. truncata*, which is the southern representative of *C. autumnalis*." During the past two summers several correspondents have sent fresh material of this genus, but in no case have I found it to contain *C. autumnalis* or *C. truncata*. I think the three localities given in my List for *C. autumnalis* should be placed under *C. hamulata*.

Cicuta virosa, Linn. Mr. F. T. Richards has recently written me saying his Coverack record is "doubtful." It will therefore not be safe to quote this as a Cornish plant.

Galium erectum, Huds. The Bodmin specimen collected by Mrs T. R. Grylls, and presented by her to the Royal Horticultural Society of Cornwall, from whence it passed into the possession of the Royal Institution of Cornwall, is too fragmentary for anyone to pronounce an opinion on it. The Menheniot record by the Cornish Moneywort Club (see my *List*) is also unreliable. In both cases I think some form of *G. Mollugo* has been mistaken.

Senecio palustris, DC. Mr. F. P. Pascoe marked this in his Catalogue sent to H. C. Watson as an "escape." It is a Fen-country plant, and has no claims to a place in a Cornish list.

Carduus eriophorus, Roth. Of this Thistle I have never been able to see a Cornish specimen. It is recorded from "near Truro," by Withering, in the third edition of his *Botanical Arrangement of British Plants*, and in my *List* Mr. F. T. Richards is the authority for it for the Lizard district. Mr. Groves, as the following remark shows, thinks it should be excluded:—"Extremely improbable. This is almost the most striking of all our native Thistles, and could not well be overlooked."

Arnoseris pusilla, Gærtn. Another of Mr. Pascoe's records to Mr. Watson which must be expunged. Devon and Cornwall are not included in its range.

Sonchus palustris, Linn. This record has been challenged by a number of critical botanists. Rev. Canon Saltren Rogers, who reported it for "Stream running into Perranporth," does not insist on the accuracy of the record as he did not keep a specimen, consequently I see no other course than to remove the name from the Cornish flora. It is quite an eastern counties plant.

Primula elatior, Jacq. I have tested the majority of the Cornish records for this species and find they are nothing but *P. acaulis*, Linn., var. *caulescens* (Koch). *P. elatior* is restricted to the Oxford Clay, in the counties of Cambridge, Bedford, &c.

Pneumaria maritima, Hill. Such a northern species is most unlikely to occur in Cornwall. Mr. Pascoe's record to Mr. Watson was based on dried and unlocalized specimens, and Mr. Müller's plant was found in a flower pot.

Veronica serpyllifolia, Linn., var. *humifusa* (Dickson). Soon after the publication of my *List* I saw living specimens of Mr. Richards's Lizard plant, and was able to convince that gentleman that it was only a vagrant form of the type. The variety *humifusa* is quite a northern plant.

Salvia pratensis, Linn. I included this in my *List* on the strength of the Rev. H. Boyden's record in a paper on "The Flora of the Scilly Isles," read before the Penzance Natural History and Antiquarian Society, an abstract of which appeared in the Society's *Transactions*, 1889-90. Mr. A. Bennett has recently seen Mr. Boyden's plant, and does not hesitate to pronounce it typical *S. Verbenaca*.

Chenopodium glaucum, Linn. Mr. Couch's remark (*loc. cit.*)—"On the beaches by the coast, common," stamps this as a mistake. Mr. F. T. Richards must also have had some other species in his mind when entering it in his list of plants of the Lizard district. Even Devon does not come in its range.

Rumex domesticus, Hartm. In excluding this species I am acquiescing with the views of the Rev. W. Moyle Rogers and Mr. James Groves, who say it is wholly northern. Mr. Watson refused to accept the Cornish and Devon records for his *Topographical Botany*, and indeed excluded all records south of Yorkshire.

Ceratophyllum submersum, Linn. My *List* retains this species and excludes *C. demersum*, Linn., whereas *C. submersum* should be excluded and *C. demersum* be retained. *C. submersum* is an eastern counties plant, and not at all likely to favour Cornish soil.

Allium Scordoprasum, Linn. No one now doubts that, capable botanist though she was, Miss Warren fell into an error

when reporting this plant for "Perran Minor." *Topographical Botany* does not countenance it for any county south of Lancashire.

Thesium humifusum, DC. Mr. Pascoe included this species in his Catalogue to Mr. Watson, and the following remark concerning it occurs in Keys' *Flora of Devon and Cornwall*:—"I learn from Mr. H. C. Watson that a specimen from this county [Cornwall] was sent to the Bot. Soc., Lond., by Rev. T. Butler." On such slender evidence, it is no longer entitled to rank as a Cornish species. *Topographical Botany* shows that Mr. Watson doubted the record.

Fritillaria Meleagris, Linn. Mr. Pascoe included this in his Catalogue to Mr. Watson on the strength of dried, undated, and unlocalized specimens, said to have been gathered somewhere in the county.

Potamogeton alpinus, Balb. Yet another of Mr. Pascoe's unlocalized records to Mr. Watson. No other botanist has been able to find a trace of the plant in Cornwall, and *Topographical Botany* questions it for the two westernmost counties.

P. coloratus, Hornem. Mr. Wise has written me recently saying he was in error when recording this for Cornwall.

P. heterophyllus, Schreb., *P. praelongus*, Wulf, *P. filiformis*, Nolte, and *Zannichellia polycarpa*, Nolte, must all be dropped as Cornish plants. It is only fair to Mr. F. T. Richards to add that they were admitted into my *List* as possible Cornish species rather than as actual ones. When botanizing in the Lizard district some years ago Mr. Richards found plants agreeing, as he thought, with the descriptions of these, but he unfortunately did not preserve specimens.

Carex acuta, Linn. Dr. Vigurs informs me that I misunderstood his note, which was intended to refer to *C. acutiformis*, Ehrh. As the claims of *C. acuta* to Cornish soil now rest on Mr. Pascoe's solitary and suspicious record, I fear it must be omitted. *Topographical Botany* doubts it for Devon and Cornwall.

Chara connivens, Braun, *C. contraria*, Kuetz., and *Nitella capitata*, Agardh, must no longer be considered Cornish subjects.

Nitella gracilis, Agardh. Mr. Groves thinks that there can be no manner of doubt that the Rev. W. S. Hore's Goonhilly record in the *Phytologist*, 1845, refers to *N. opaca*, Agardh, and that *N. gracilis* should therefore be deleted.

5. VARIOUS NOTES.

There are a few items which demand special attention. On page 55 of my *List* mention is made of a strange clover which appeared at Falmouth Docks, and which I suggested might possibly be *Trifolium ochroleucon*, Huds. I had previously taken specimens to the National Herbaria at the Royal Botanic Gardens, Kew, and the British Museum, but could not match them with any of the British or Continental examples of *ochroleucon*, or indeed with any other clover. Dr. Otto Staph was induced to take the matter up, and after a careful comparison of the plant with a number of species in Continental Herbaria he came to the conclusion that it was a variety of *Trifolium albidum*, Retz., previously unknown to science, and to which he has given the name *ramosum*, Staph. At a meeting of the Linnean Society, on June 5, 1902, Dr. Staph read an interesting paper on the subject, and exhibited specimens of the new variety, together with Continental examples of the species. It seems that the species was in cultivation in various botanic gardens on the Continent in the early part of the last century, and that it was grown at Kew as late as 1856, though where the Kew specimens came from no one appears to be able to say.

Pinguicula grandiflora, Lam. For many years botanists have been concerned about the presence of this plant in Cornwall. Not that anyone ever doubted its introduction, as it is a matter of common knowledge that the only places in the British Isles where it has any claims to nativity are a few favoured parts of Kerry and Cork, in Ireland. In West Cornwall it is known as "Dr. Ralfs' plant," and it has puzzled students of plant geography to understand why so eminent a botanist as Dr. Ralfs should interfere with our flora by introducing a plant which has no more right to a place in "the first and last county" than the Man or Monkey Orchis has. Mr. E. D. Marquand has recently pointed out to me that Dr. Ralfs did not intentionally introduce this rather handsome plant. Specimens were sent him from

Ireland for research work, which were kept in a soup plate of water in his window. Sometime after, being about to start on a prolonged botanical excursion to Wales, and fearing the plants would be neglected during his absence, Dr. Ralfs deposited them in a secluded spot on Tremethick Moor, a few miles west of Penzance. Illness prevented him from fetching them back on his return, and when he was able to go to the Moor to look for them no trace of the plants could be found. Some years afterwards Mr. W. Curnow, an enthusiastic Cornish botanist, rushed into Dr. Ralfs' study in a state of excitement, and announced that he had discovered *Pinguicula grandiflora* on Tremethick Moor, at the same time asserting that it would rank among the botanical sensations of the year! The Doctor accompanied Mr. Curnow to the Moor, and after admiring the hundreds of plants scattered about, told his companion how they got there.

Euphorbia Peplis, Linn. On page 193 of my *List* I state that "in all probability this plant disappeared from Cornwall many years ago." As a matter of fact at the time when the *List* was published no one appears to have found it west of the Tamar since 1852, when it was gathered on St. Agnes, one of the Scilly Isles, by a Mr. Woods, and as it is a fast vanishing species in other parts of England it seemed a safe assumption that after fifty years without a single record for Cornwall it had disappeared from the county. I am glad to be able to say such is not the case. Seeing the doubt expressed in my *List* of the plant now occurring on Cornish soil, Mr. R. N. Milne, of Blackheath, wrote me saying he had found it at Porthellick Bay, St. Mary's, Scilly Isles, in 1900, at the same time forwarding a voucher specimen. This will be welcome news to Cornish botanists in particular, and to British botanists in general.

AN EXPLORATION OF TREGAER ROUNDS.

BY REV. S. BARING GOULD, ROBERT BURNARD, REV. J. K. ANDERSON,
AND J. D. ENYS.

This camp is situated between Tregaer Farm-house and the main road leading from Wadebridge to Camelford, about one mile north of Port Isaac Road station, in the parish of St. Kew, Cornwall.

It is labelled Dameliock Castle by the Ordnance surveyors on the strength of statements in D. Gilbert's and Polwhele's histories of Cornwall.

In the former work (under St. Tudy) it is stated that "in this parish, as I take it, or St. Kew, is still to be seen the ruins of a once famous and treble intrenchment of our ancestors, the Britains, called Dameliock Castle and taxed by the name of Dimelihoc in the Domesday Book, 1087."¹

In Polwhele's History the reference is as follows: "Gothlois being then at his chief palace and castle of Caer-Isca (Exeter) quitted the same upon their approach with his army and returned with the lady and posted themselves in this Castle of Dumdagell, where he left his Duchess, himself retiring to Dameliock Castle, now in St. Udye or St. Kew."²

The story of Gothlois (or, as he is properly called, Gorlois) is found in Geoffery of Monmouth's History of the Britons and, in brief, is as follows:—He was Duke of Cornwall and was besieged in Damelioc by Uthyr Pendragon.—Whilst he was there shut in Uthyr went to Tintagel and, assuming the appearance of Gorlois by the assistance of Merlin, introduced himself to the castle and Igera, wife of Gorlois, and by her became the father of King Arthur.—Geoffery of Monmouth, *Historia Regum Britanniae*, viii., c. 19.)

¹ Vol. IV. p. 94. C. S. Gilbert (Vol I., p. 205), says "obviously once a Danish fortification." (!)

² Polwhele, p. 135, note Hals.

Although adopted by the Ordnance surveyors, the name of Dameliock is unknown in the neighbourhood of Tregaer. There is a manor of that name in the parish of St. Denis, where there is a conspicuous camp on very high ground, in the midst of which is the church of St. Denis—a Norman adaptation of *dinas* (royal camp). There is much more likelihood that this is the Dameliock of the legend and that Gilbert and Polwhele were mistaken in locating the site in St. Kew parish.

In confirmation of this the exploration of Tregaer Rounds disclosed no evidence of occupation of so late a period as that of King Arthur.

The authors have referred this matter to the Ordnance Survey Office, with the result that the name Dameliock will be omitted from future reprints of the Ordnance maps. All the local folk are familiar with Tregaer Rounds, and by this name it should be described.

Maclea³ refers to Tregaer as follows:—“On the high
 “table land on the north side of this parish [St. Kew] is a fine
 “earthwork or encampment, which has not, we believe, hereto-
 “fore been described. It is situate close to the great road
 “leading from Warbstow and Titchbarrow on the north-east of
 “the county to St. Minver, which has been already noticed, and
 “it commands a view of the important work at Warbstow as
 “well as of Michelstow Beacon, Castle Canyke, &c. The main
 “work at Tregaer is circular in form and consists of two
 “embankments, a short distance apart from each other,
 “strengthened by deep external ditches. The approach is from the
 “lower, or south-eastern side, and the entrance is protected by
 “a bastion or external wall, which, springing out of the outer of
 “the two embankments above mentioned, encircles the whole of
 “the work on the southern and eastern sides until it debouches
 “upon the great road above mentioned, which passes on the north
 “side of the work. The entrance is opposite to those leading to
 “the inner circle. This external wall is in some places very high
 “and was originally defended by a ditch which has now been
 “filled up; and on the north-eastern side the wall itself has been
 “removed under the processes of cultivation, but the site is

³ Vol. II., p. 80.

“easily traceable across the field numbered 591 on the parish map and, probably, the remains of the ditch yet exist for a short distance along the south side of the road. The outer gate is approached by a ditch or covered way from the valley below, which covered way still remains crossing a field numbered 600 on the parish map. This important work, which is numbered 592 and 593 on the map, has given its name to the farm on which it is situate.”

The plan given of Tregaer Castle by Maclean shows faint traces of the encircling outer wall, which have now disappeared or nearly so, and of the remains of the covered way which leads up from the valley towards the entrance of the camp. The intervening field has been levelled within living memory, and the portion of the covered way close to the camp has been filled in.

The present condition of the camp is as follows:—Tregaer Rounds is constructed on the side of a hill at a mean elevation of 500 feet above sea-level, sloping about 4° to the S.E. The highest point in the neighbourhood (575 feet) is not far from Treore (or Trerure) Farm, about 800 yards to the N.W.; consequently it is not in, what we should consider, the strongest possible position for defence. Doubtless there was some good reason for this, and it seems that traces of a small occupation of the higher ground exist (in a field known as Big Downs, on Trerure Farm), from which point the country towards the sea, as well as Port Isaac and Port Gaverne, would be constantly under observation, and it may have assisted in this way, as an outpost, what would otherwise have been the weakest part of the fortress.

The camp consists of two concentric earthworks and a defence flanking the entrance.

The inner circle is composed of a parapet and ditch, which are complete except on the S.E. portion facing the entrance. Here, for about 300 feet, parapet and ditch entirely disappear as such, and a steep slope, about 10 feet high, takes their place. Whether this was the original construction we cannot say but, if so, this portion of the position would have been equally strong if this slope had been protected at the bottom or top with a

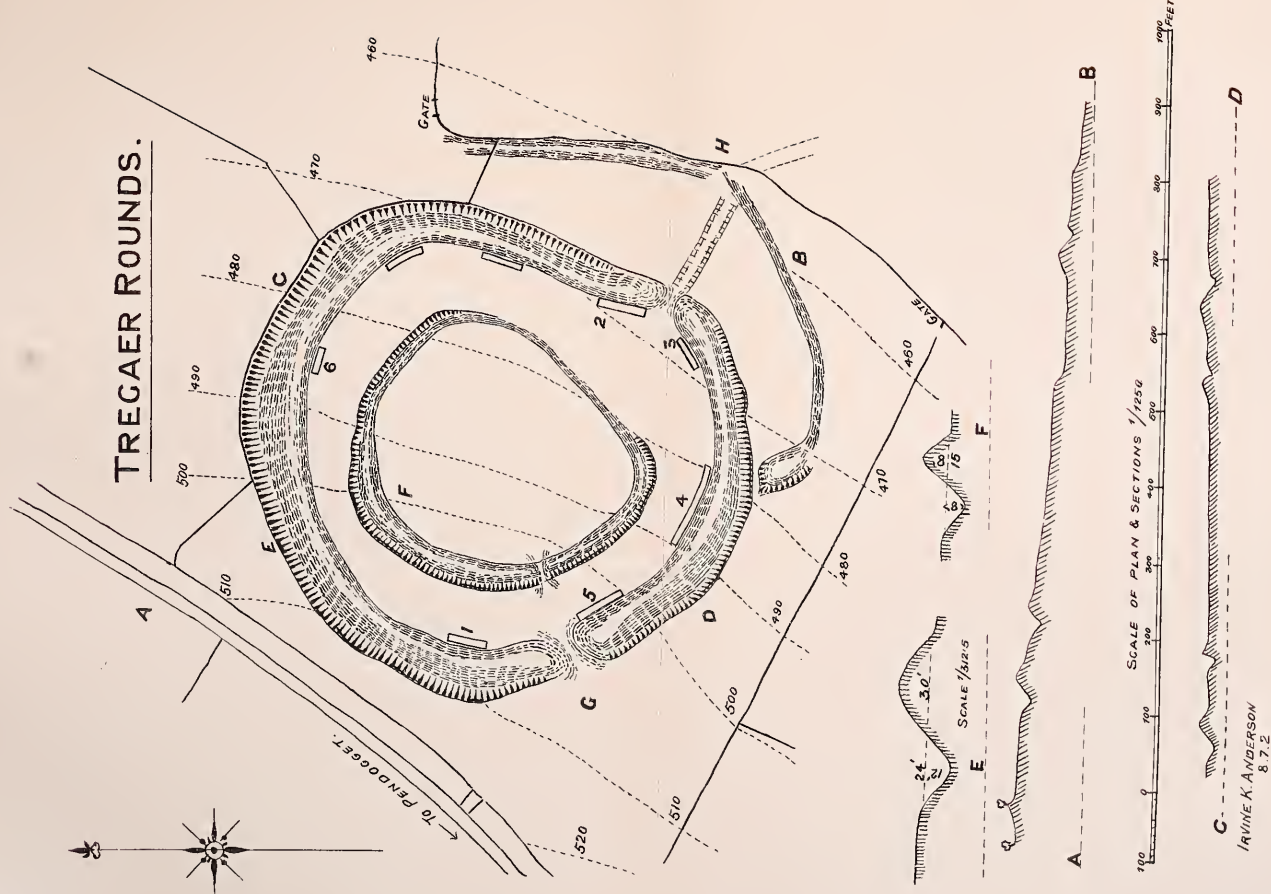
strong stockade of wood. This inner ring covers an area of $1\frac{3}{4}$ acres.

The outer earthwork is practically perfect except so far as it has suffered from the ravages of time and sheep. It consists of a rampart and an external ditch, the former presenting a slope of 45° to the bottom of the ditch. In some places the rampart is still 30 feet thick at the natural level and, most probably, had a height of 10 feet, at least, above this level. It encloses an area of rather more than $7\frac{1}{2}$ acres.

On the S.E. of this circle is the entrance to the fortress, well defined and still quite distinct as such. From no other point than the entrance, on the lower side of the fortress, can its interior be seen. A regular well-trodden depression, about 12 feet wide, still shows the approach to this entrance, which was defended and masked by a work some 120 feet distant from it, concentric with the outer and inner circles and extending about 300 feet on each side of it. That portion extending N. consists of a strong rampart about 12 feet high and proportionally thick, but that towards the S.W. is merely a steep slope varying from 10 feet to less in height: this otherwise rather weak portion (if it does not represent the remains of a rampart) may also have been strengthened by a stockade. Apparently this last portion of the fortress was a covered way protecting the entrance from a front attack, and were it not for this the weakness of the place, sloping as it does in this direction, would be at the mercy of slingers and archers; but this very slope gives the surface of Tregaer a maximum of sunlight while the rising ground at the N.W. has, doubtless, some climatic advantage.

Within 400 feet of this outermost defence is a brook within easy reach of the garrison and, probably, the water supply of the place.

The most striking features of the view from Tregaer Rounds are Row Tor, Brown Willy, Alix Tor, Carbilly, Hawks Tor, Helmen Tor, Bodmin Beacon, and the earthwork known as Helsbury Castle, $3\frac{1}{4}$ miles as the crow flies, slightly to the south of east, and standing at about 130 feet greater elevation. Another small circular camp, Pengenna Castle, stands about two miles S.E. from Tregaer on lower ground and



invisible from it. The covered way from Tregaer Rounds to the valley below points in the direction of Pengenna, but whether there is an actual connection between the two places the authors have been unable to ascertain. Whether these two camps were contemporary we are not yet in a position to say.

An adit has been driven from the ditch under the rampart nearly opposite to, and in the direction of, 4 on plan. It has a length of fifty-one feet, is about five feet wide and six feet high. The soil, &c., from this excavation have been placed on a heap at x (see plan). Although modern, none of the inhabitants could explain why such an excavation was made. Some thought that it was a mining adit made many years since, when the neighbourhood was worked for antimony, and others thought it was a potato kieve or a hiding place for smuggled goods.

It is undoubtedly modern and had nothing to do with the construction of the camp. It is curious that the excavators took the trouble to carry the material and deposit it at x when they might easily have thrown it out in the ditch on each side of the entrance to the adit. This entrance is closely masked with bushes and is not easily found by a casual visitor. The exploration commenced on May 21st, 1902, and was continued on the 22nd, 23rd, 24th, 26th, 27th, 28th and 30th. Six men were employed. Trenches were dug measuring 827 feet in length and were carried down in some cases to 6 feet. The breadth of these varied from 4 to 10 feet.

In every case but one the excavations were continued down to the undisturbed sub-soil or "raze" as it is locally called. The inside of the outer ring or rampart was first examined and eighteen trenches were dug close to the foot of, and following the trend of, the embankment, at intervals, around the whole circumference.

Short trenches were also driven into the rampart and others again were extended into the enclosed area. Experience has demonstrated that the hut sites and camping places in these early strongholds are usually to be found close up under the lee of the ramparts, and the efforts of the explorers were concentrated in this direction. The cultivated land enclosed within the boundaries of the camp was disturbed as little as possible.

In the whole of these eighteen trenches some wood charcoal was found, together with sling stones and fragments of shillet of varying sizes with whole and half rounds of circular perforations.

Twelve of these trenches may be dismissed with this general statement: the remainder merit some further attention. These are numbered and situated as follows (see plan):—

- No. 1. Under the lee of the northern portion of the rampart.
- „ 2. Under the southern rampart, commencing at the entrance and extended 92 feet east of same.
- „ 3. Commencing near the other side of entrance and continued 45 feet westward.
- „ 4. Under the lee of the western portion of rampart—this trench was 76 feet in length.
- „ 5. A short trench of 33 feet under north-west part of rampart.
- „ 6. Under east rampart.

The finds were as follows:—

- No. 1. Perforated fragments of shillet; sling stones; some limpet shells (these were found on digging into the rampart); fragments of wood charcoal were observed at the bottom of the trench and more occurred at a point where a short curving wall of small slate stones was built up against the foot of the rampart. This may have been a hut site but diligent search in this proximity failed to disclose any fragments of pottery or other objects of human fashioning.

The excavation, which was carried far into the rampart, demonstrated that the bank was composed of shillet rubble mixed with soil and that no retaining wall was erected. This was confirmed in subsequent examinations both inside and outside the rampart. No. 1 trench was carried down to about two feet where undisturbed ground was reached.

- No. 2. This turned out to be the most important excavation and yielded by far the best results. The trench was commenced close to the foot of the rampart and was widened out towards the enclosed area as the

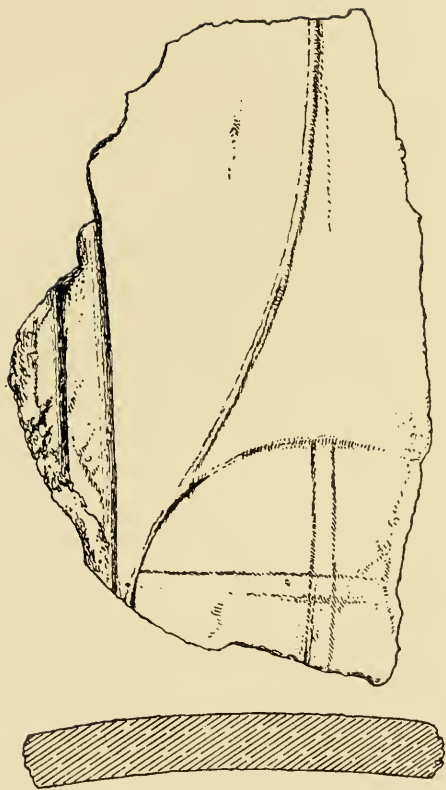


FIG. 1. SHERD FOUND AT TREGAER ROUNDS, EXCAVATION No. 2.

digging progressed. There were varying depths before the sub-soil was reached—the greatest was five feet; all were through the debris from the rampart.

There were no signs of walls or remains of any kind of dwelling on this spot. The finds, however, clearly indicate that it was the site of a camping place. There was much charcoal and sling stones in abundance, also many fragments of shillet with holes which had apparently been punched by means of sharp-pointed picks or some similar tool.

Two and a half feet below the present surface, when sinking through the debris of the rampart, two small fragments of pottery were found. These are buff coloured outside, whilst the inside is slightly coated with a yellowish glaze.

At a depth of four and a half feet the undisturbed sub-soil was reached and, resting on this, lay a nest of sixty four sling stones, two fragments of much rusted iron, three sherds of rude pottery, one piece blackened inside and out and possessing some ornamentation of the usual early type together with curved and straight intersecting lines.—(See figure 1.)

Nearer the entrance the excavation shallowed and the undisturbed bottom was reached at a depth of two feet. Here thirty sherds, large and small, were found together with a few ounces of cinders impregnated with oxide of iron, some nodules of mineral which appeared to have been exposed to heat, and four water-worn flat pebbles, one of which had been used as a grinder.

The pottery, rude and probably hand-made, represented the remains of two vessels. The ornamentation on some of these sherds is similar to that borne on pottery of the bronze age type. (See figures 2 and 3.) One sherd was perforated and through another hole an iron rivet was inserted. (See figure No. 4.) A nodule of burnt clay was also found in this excavation.

- No. 3. Bottom was reached at three feet and much charcoal found resting on and around some flat slabs of shillet forming a hearth three and a half feet by two and a half feet. This excavation yielded many perforated fragments of shillet and a considerable number of sling stones. Here a spindle-whorl was found.
- No. 4. Besides yielding perforated fragments of shillet and sling stones, the only feature of interest was a bed of fired clay, eighteen inches under the present surface, which was apparently the remains of a hearth, for it was associated with a considerable amount of charcoal.
- No. 5. Here another spindle-whorl was found, a little charcoal and ten sling stones; also a wheel-like disc of slate.
- No. 6. This yielded the third spindle-whorl, thirteen sling stones, and traces of charcoal at the bottom of the trench, which was sunk down to the sub-soil, eighteen inches below the present surface.

The inner ring was next examined and nine trenches were dug inside the remains of the rampart, but nothing was found to indicate camping sites. No charcoal was observed.

An excavation was made in the south-west portion of the moat of the main rampart with the view of determining its original depth. It had to be carried down six feet before the undisturbed ground was reached.

Two trenches were dug in the moat east and west of entrance, but were not carried down to the sub-soil. These yielded several sling stones.

A short trench was dug in the entrance to the main work but without result.

REVIEW OF THE FINDS.

Sling stones.—Some hundreds of these were found; every trench gave a few, and some—notably No. 2—yielded a large number. They are water-worn pebbles, mostly quartz, and were recognised by the workmen as similar to the beach pebbles found on the coast at Port Gaverne. Six to eight weighed together about a pound. Some much smaller pebbles were observed that were too small for missiles and may have been used as counters in some game.

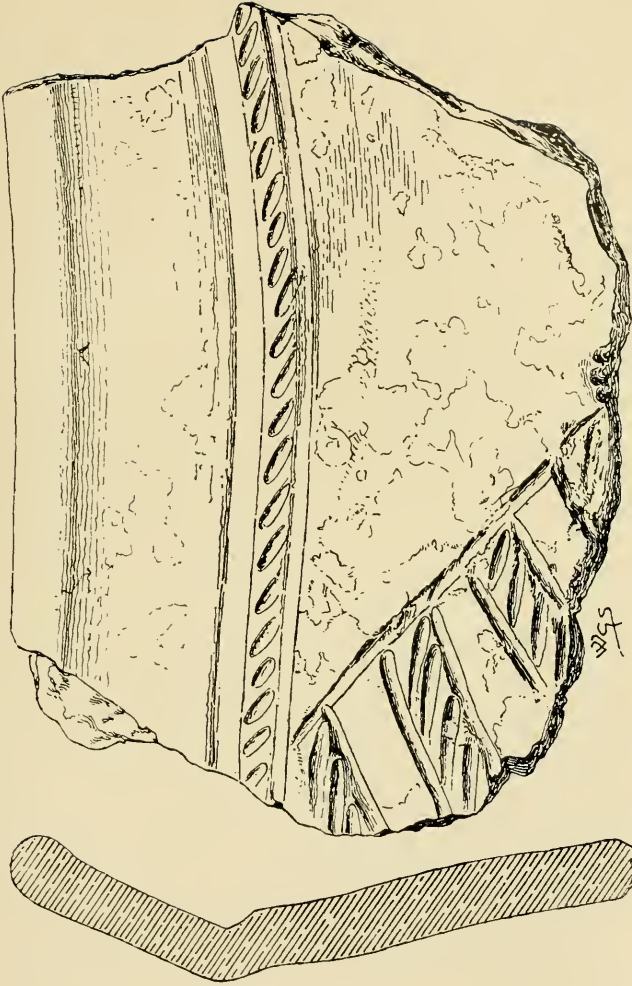


FIG. 2. SHERD FOUND AT TREGAER ROUNDS, EXCAVATION No. 2.

Fragments of perforated shillet.—These abounded all over the site—some on the surface, some deep in the trenches, and some in the rampart. The greater number of these perforations were, no doubt, accidentally produced.

In digging out the loose shillet from the trenches the workmen repeatedly produced semi-circular notches on the slabs and occasionally punched a hole clean through with their picks, and these were blunt from use.

With a sharp pick clean tapering holes were produced, broader where the pick entered and narrowing to point of exit.

These objects existed in such profusion that the conclusion was forced home that many of the semi-circular notches and holes were produced by the builders of the camp in winning the shillet from the moat, and subsequently piling up the debris to form the ramparts.

Some of the fragments of shillet appear to have been perforated for a useful purpose—the holes having been deliberately made by punching and then improved by some small pointed instrument, for the tool marks are distinctly visible. It has been suggested that some of these perforated slabs of shillet may have been used as weights for keeping down the thatching of huts.

No remains of hut walls were found in the camp with the possible exception of the faint indication found in trench No. 1. This need not, however, destroy the the thatch-weight theory, for good building stone is very scarce near Tregaer, and the dwellings or shelters of the guard or caretakers of the camp may have been of wood with thatched roofs. Timber was not scarce, for there is a legend of a great and probably ancient forest extending from Tregaer to Lanowe (St. Kew) in which ranged a great black bear or boar, which was slain by St. Kew who, as a thanksgiving, removed the church from Lanowe to where it now stands in the village of St. Kew.

The large pebbles found in the trenches had been used as rubbers and pounders. Local information indicates that they were obtained from the neighbouring sea-beaches.

The spindle-whorls are of soft shillet, rubbed down to shape, with holes drilled from each side.

The small lumps of iron found in trench No. 2 are shapeless and, of course, much oxidised.

The nodules of supposed mineral which had been fired turned out, on examination, to contain no metal. The shining specks were quartz and mica.

The pot sherds found in No. 2 represent the remains of at least two vessels. One of these, judging from the sweep of the rim fragment (fig. 2), had a mouth diameter of about six inches, and a probable height of about 10 inches. The outside upper portions of the sherds of the pot are darkened, apparently by smoke, whilst the sherds representing the lower walls of the vessel retain their original colour of light yellowish brown. This dark staining of the upper portion might have been caused when the pot was fired during process of manufacture or by standing, when in use, near a fire with the lower part inserted in a hole in the ground. The interior of the pot retains its original colour. The ornamentation is of the bronze age type. The remains of the other vessel indicate a mouth diameter of about the same as the above but it was, probably, not quite so high. The pot is brick red, both inside and out, and the remains of ornamentation are of an early type—(fig. No. 3). Both these vessels were probably wheel-made.

Two sherds demand special attention. The first (fig. 1) is almost black, and is very similar in appearance to Gaulish pottery of the early iron age. The ornamentation is composed of a curved line springing from a circle which is intersected with lines forming a cross. This type of curving and circular ornamentation exists on a bronze sword scabbard found at Hunsbury Camp, near Northampton, ⁴ and also on a bronze mirror found at St. Keverne, Cornwall, ⁵ and on two other specimens discovered in a late bronze and early iron age cemetery at Mount Batten, Plymouth. ⁶

The second sherd (fig. 4) has two holes drilled through it, one of which contains the oxidised remains of an iron rivet. It is not clear whether this is intended as a repair or for some other purpose. This sherd is, probably, part of a pot not made on a

⁴ Associated Archl. Soc's. Report xviii., pp. 53-61.

⁵ Archl. Journal, Vol. xxx., p. 267.

⁶ Archaeologia, xi. pp. 500-10.

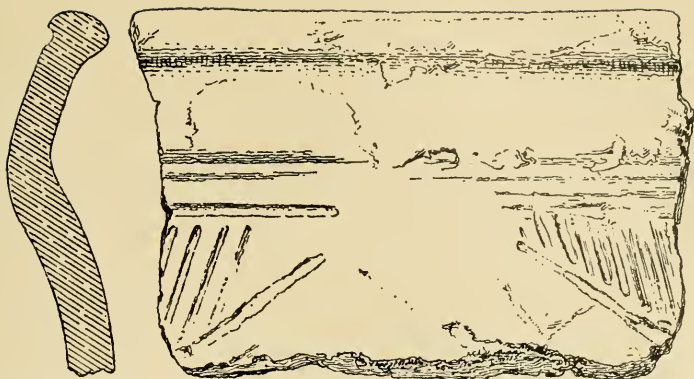


FIG. 3. SHERD FOUND AT TREGAER ROUNDS. EXCAVATION NO. 2.

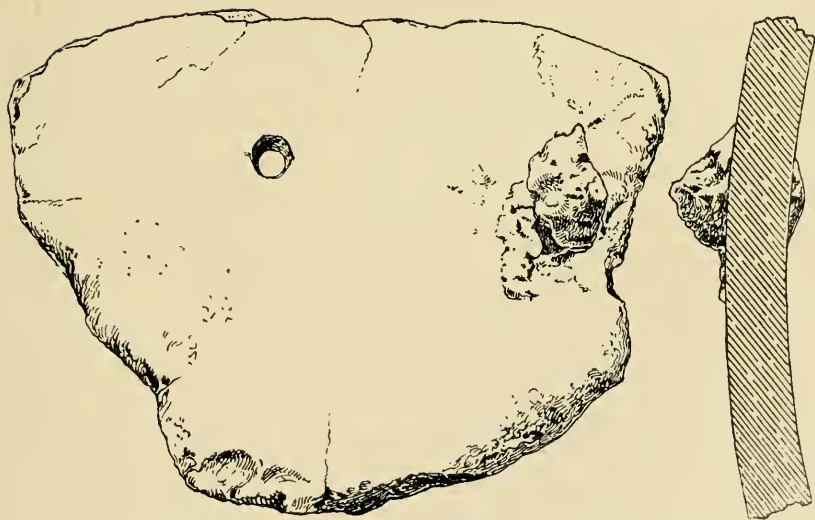


FIG. 4. PERFORATED SHERD FOUND AT TREGAER ROUNDS. EXCAVATION NO. 2.

wheel, it is rude enough to be considered to be hand-made, or made on a plate which was turned with one hand while the other shaped the clay, a sort of midway process between hand and wheel-made.

This process is carried on to-day at Ordessan, in the Pyrenees, where each housewife makes her own household pottery in this way. The vessels are then filled with and packed with dry fern which is set on fire and the whole covered over with earth and dry sods so as to form a sort of smother kiln.⁷ The result is said to be a ware much resembling the rude hand-made pottery of primitive times.

The pot sherds are clearly pre-roman, and the formation and occupation of Tregaer Rounds may be reasonably ascribed to that period. The Romans, although passing by it in their journeys to their station at St. Minver, apparently neglected it as a stronghold, for not a single object was discovered during the exploration, which possessed any sign of Roman influence.

The conclusion arrived at, in the light of the finds, is that Tregaer Rounds was a fortress of the period which may be conveniently described as the early iron age.

Permission to explore Tregaer Rounds was very readily given by the owner, Mr. J. B. Fortescue, of Bocconnoc, and for this the explorers are very grateful.

With the hearty co-operation of the occupiers of the land, Messrs Hawken and Harris, the work of exploration ran on smoothly and pleasantly, and there was no lack of efficient labour.

⁷ *Archl. Journal*, lix. No. 3, p. 225.

THE BUILDERS AND THE ANTIQUITY OF OUR
CORNISH DOLMENS.

BY REV. D. GATH WHITLEY.

So unsatisfactory is the state of archæological nomenclature, that I am compelled to define what I mean by a Dolmen. I apply this term to those rude stone structures, which are often called Cromlechs; but as they are named Dolmens on the Continent I think it is desirable that a uniform definition should be adopted. The typical dolmen is formed of upright stone slabs, with a horizontal cap-stone. When the uprights are of great size and are formed of slabs touching each other, they enclose a chamber, as may be seen in Trevethy Stone, near Liskeard. Sometimes the uprights are mere slender shafts, so that no space is enclosed, as appears in Lanyon Cromlech near Penzance.¹ Occasionally one end of the cap-stone rests on the earth, and the other on an upright, when the monument is called a demi-dolmen.² An example of this type may be seen in that rude structure named "The Brothers of Grugith," in the parish of St. Keverne, in the Lizard district.³

Now, these dolmens have been under examination for a lengthy period, and, what have we done with them? We have measured them, and we have mapped them. We have sketched them, and we have photographed them. We have classified them according to their form and their size. We have speculated about their origin; whether it were religious, or sepulchral, or commemorative, or astronomical. We have debated endlessly, as to whether they were always, or generally, covered with a tumulus. We have theorised as to the manner of their construction; and, above all, we have never failed to laugh at the Druids! But when the vital questions are asked—"Who raised these monuments?"—and, "At what period were they erected?"

1. In this arrangement I follow Mr. W. C. Borlase in his *Nenia Cornubia*.

2. So termed by M. de Mortillet in his *Le Préhistorique, Antiquité de l'Homme*.

3. Of course the collapse or removal of an upright may have given rise to the form of some demi-dolmens.

speculation is hopelessly at sea. The dolmens have been assigned to every era, from the beginning of the Neolithic age, down to the 8th century after Christ. Sometimes we are told that they were built by *one* race; and sometimes by *many* races, but it is generally admitted that it is impossible to give a definite opinion, and that the problem of the dolmens is insoluble.⁴

How is it that these results are so unsatisfactory? I believe it is owing to three great errors.

The first is, that we have persistently endeavoured to ascertain the age of the dolmens by digging in the earth beneath them. Now, this soil has been constantly disturbed for thousands of years. Men, foxes, badgers and rabbits, have dug into it for ages, and have turned it over and over, so that modern coins are found by the side of stone and metal tools. The soil under the dolmens often contains tools of stone, bronze, copper and iron, in profusion; and trinkets of gold, silver, glass and amber; and coins of all ages, from the times of the Romans down to the present age. Let us take, as an illustration, the dolmens of France, which contains more of these structures than any other country in Europe. These dolmens are now used as sheep-pens and cattle-houses, and are inhabited by shepherds, pedlars, gypsies, and even money-coiners. Lunatics have been confined in them,⁵ and in times of epidemics, they have sheltered families. During the Revolution they were hiding places for Royalists, and refugees lived in them in the days of religious persecutions. In the civil wars they were constantly used by the combatants, and, in earlier days, Roman soldiers and Celtic herdsmen camped in them, and used them as burial places. They have been ransacked for treasures by Romans, Northmen, and by recent plunderers, and archeologists with pick and spade have turned over, again and again, the soil within them. What value for finding the age of the dolmens can be attached to these diggings? Clearly none at all.

Skeletons of all forms and sizes have been found under the dolmens, with skulls of all shapes. No wonder that some anthropologists declare⁶ that there were *several* races of dolmen-

4. See M. Joly's *Man before Metals* (3rd English edition), p. 159.

5. *La France Préhistorique*, by E. Cartailhac, p. 307.

6. M. de Quatrefages in *Hommes Fossiles et Hommes Sauvages*, pp. 106, 107.

builders! and that M. de Mortillet affirms⁷ that they were built by many races, because they contain many kinds of skeletons! These confused and contradictory results are clearly owing to our searching for light by a wrong method, and in a wrong direction.

Another error arises from considering each dolmen *separately*, and not looking at it as a member of a widely-extended series. Thus, those in Cornwall form a part of the series of dolmens in Great Britain, and the British dolmens form a portion of the series of Europe and Africa. We must consider the whole chain, and not fix our attention merely on one or two links. As long as our view is limited to Cornwall, we shall certainly fall into serious errors.

It is often contended that many dolmens bear marks of having been squared and fashioned by metal tools. And that consequently they must be of recent origin. Even if the fact were admitted, the inference might be incorrect. For the question is not whether the dolmens now show that metal tools have been used upon them, but whether metal tools were used upon them at the time of their erection, which is an entirely different question, and most difficult to answer. This arises from the fact that we have historical evidence which proves that some dolmens, and even menhirs,⁸ have been re-cut in recent times. A remarkable illustration of this is furnished by the dolmen of Saint Germain-sur-Vienne, in Central France. It consists of a cap-stone supported by four uprights, the tops of which have been cut in the form of capitals, and their sides smoothed. The monument was in the Middle Ages used as a chapel, the space between the pillars being built up. The uprights, therefore, were cut into the form of pillars, about the 10th or 11th century.⁹ Another example of a dolmen converted into a chapel is found in the church of the Seven Saints, in Côtes-du-Nord, in Brittany.¹⁰ But, even if the stones of the

7. *Révue Scientifique*. Aug., 1874. Also, *Le Préhistorique en Europe*, by G. Cotteau, p. 141.

8. *La France Préhistorique*, p. 319.

9. *Memoirs sur les Restes d'Industrie dans le Département de la Charante*, by A. T. de Rochebrune, p. 100. Also, *La France Préhistorique*, p. 305. This dolmen is also figured in Mr. Fergusson's *Rude Stone Monuments in all Countries*.

10. *La France Préhistorique*, p. 306.

dolmens were squared and fashioned at the time of their erection it does not follow that this was done by metal tools. Even in the Palaeolithic age stone slabs were framed by man without any metal implements. In the cave of Frontal in Belgium a sepulchral orifice was closed by a limestone slab, which exactly filled it. This was overlaid, and forced out of its place by a clay deposit of true Palaeolithic age, as is proved by its containing the bones of the lion and the rhinoceros.¹¹ In the Neolithic age, also, we find the same thing. The opening in the sepulchral chamber in the Aurignac cave had been closed by a limestone slab, which had been made exactly to fit the orifice.¹² Confirmatory evidence comes from America. The ancient Peruvians excelled in the art of working stone, but they were ignorant of iron at the time of the Spanish conquest, and their bronze and copper tools have been proved to be too soft for fashioning stone.¹³ In Arizona, in North America, the wonderful stone houses of the Cliff-dwellers stand in the recesses of the precipices, and on the slopes of the chasms and gorges of the rivers. And yet, in these ruins no trace of metal has been discovered save a few copper rings, so that we are compelled to conclude that their builders framed the stones without the aid of metal tools.¹⁴

I believe, also, that another error arises from uniting the dolmens with such stone monuments as gallery graves, chambered tumuli, and artificial grottoes. From this has arisen the practice of making "transitions" and "connecting links" between the different megalithic monuments.¹⁵ This has led to much ingenious speculation concerning the evolution of dolmens, but the result has been to complicate the discussion in such a way as to involve the question in the most extricable confusion.

An opinion is frequently expressed that the dolmens were built by *many races*, and at *various times*. According to this theory, we must speak of a dolmen-building phase, and not of a

11. *L'Homme pendant les Ages de la Pierre*, by E. Dupont, p. 196. See also, *Fossil Man*, by Sir J. W. Dawson, pp. 296, 297.

12. Lyell's *Antiquity of Man* (First edition), p. 183.

13. *Peruvian Antiquities*, by MM. Rivero and Von Tschudi, p. 230.

14. This is the opinion of the Marquis of Nadaillac, in his *Prehistoric America*, p. 240.

15. See *Le Préhistorique, Antiquité de l'Homme*, by G. de Mortillet, pp. 599-600. Also, *Le Préhistorique en Europe*, by G. Cotteau, p. 141.

dolmen-building race.¹⁶ Those who hold this theory maintain that the building of dolmens marks an era in the history of civilisation. When a race reaches a certain stage in its history it builds dolmens, and in time the erection ceases because the race grows out of the phase.

I reject this theory entirely, and, in opposition to it, I hold that they were erected by *one* particular race, and that they ceased to be built because that race mysteriously disappeared.

If dolmens were built at all eras, and by many races, then we ought to find them scattered promiscuously over Europe and Asia, but this is exactly what we do *not* find, for the dolmens are distributed in a well defined zone or band. If they mark a phase through which all races have passed, then races will pass through the phase at different times in the world's history, some earlier and some later. It follows, therefore, that some races ought to have been in the dolmen-building phase in historical times, and some even should be building dolmens now. But history records no account of any people building dolmens, nor, with the solitary exception of the Khasias of the North Eastern India,¹⁷ do any people erect dolmens in the present day.

Besides this, there are countries in which we can trace a regular progress from the earliest Stone period right down to the Iron age, but no dolmens occur in these countries. For instance, in Austria we find the earliest traces of Palæolithic Man in the alluvia of the valley of the Danube,¹⁸ and we have a series of Neolithic weapons, as well as relics from the Bronze and Iron ages,¹⁹ in different parts of the country. Here then, is a region in which the inhabitants must have passed through the

16. *Le Préhistorique*, by M. de Mortillet, p. 590.

Also, this opinion is advanced by Mr. H. M. Westropp, in a paper entitled *Cromlechs and Megalithic Structures*, which is printed in the *The Journal of the Ethnological Society* for 1869. Some scientists, like M. Cartailhac, find the problem so difficult that they are unable to give any opinion. *La France Préhistorique*, p. 200.

17. The Khasias are not in the elementary Period in which the dolmen phase is supposed to occur, as they are in the Iron Age, and so, by the theory, are long past the stage in which dolmen building should occur. See *Himalayan Journals* by Sir Joseph Hooker, vol. ii, pp. 277, 320. *Journal of the Anthropological Institute*, vol. v, pp. 37-41.

18. G. Cotteau, *Le Préhistorique en Europe*, pp. 195, 204.

19. *Ancient Stone Implements in Great Britain* by Sir John Evans (2nd edition), p. 529.

dolmen phase, and we ought to find dolmens in the country; but there are no dolmens in Austria. In South Africa, also, there are weapons of the Palæolithic period, in the shape of rough flints which are found in many places in Cape Colony.²⁰ These are succeeded by tools of the Neolithic age, which are found in the same region, and the natives now use iron weapons. Here, also, the natives have passed through the dolmen phase and we ought to find dolmens in the country: but there are none. I believe, therefore, that the dolmens were built by *one special race* at one particular time in Europe, and that dolmen building ceased because the builders completely and mysteriously disappeared. This view may not be accepted by many, and will probably be rejected by some because it will be declared to be "behind the time" and not "up-to-date." But I maintain that in weighing the merits of a scientific theory what we have to consider is not whether it is "out-of-date," or "up-to-date," but whether it is *right* or *wrong*; and no mere epigrammatic phrases, however ingeniously conceived or cleverly expressed, should prevent us from considering the question in this manner.

After the battle of Colenso, when the foreign officers attached to the British army were discussing the action, the American attaché, whilst deploring the loss sustained by the British in their failure to carry the Boer position by a frontal attack, asked—"Was there no way round the corner?" It seems to me that the frontal attack on the dolmen-position, which seeks to ascertain the age of these monuments by digging beneath them, having completely failed, we had better try to find some way "round the corner," and seek for success in other directions.

Let us begin by considering the geographical distribution of the dolmens, for here is a new way of investigating the question. Good maps are necessary, and, although in France these have been prepared by the labours of MM. Bertrand, de Bonstetten, and Mortille, England is, unfortunately behind, in this matter.²¹

20. *Report of the Norwich Congress of Prehistoric Archaeology*, 1868, pp. 69-71. *Ancient Stone Implements*, pp. 337, 654. *Journal of the Anthropological Institute*, vol. xiii, p. 162.

21. A map of the distribution of rude stone monuments prepared by Col. A. Lane-Fox, appears in the *Journal of the Ethnological Society* for 1869.

An examination of a good dolmen map shows us that they do not occur in all countries, but form a well defined band running down the west coast of Europe, and along the northern coast of Africa.²² The most northern dolmen in Europe is found near Frederickshald, in southern Sweden, in 59° N. Lat., from whence the dolmen-line runs through Denmark to Hanover, but there are no dolmens worth mentioning to the east of the Elbe.²³ In Holland dolmens known as *Hunevedden* occur in the province of Drenthe,²⁴ and from the Low Countries the band of dolmens crosses the sea into Great Britain. In the British Isles dolmens are most numerous in the western districts, such as Wales and Cornwall: Ireland is also rich in dolmens.²⁵ In the Channel Islands they are found and have been well described by Messrs. Lukis and Oliver.²⁶ France contains more dolmens than any other country in Europe, there being nearly 3,500 of these monuments known within its limits. They occur chiefly in Brittany and in the south-east, and run across France in a band from Cape Finisterre to the Gulf of Lyons. Thus, if a line be drawn from Morlaix in Brittany to Narbonne, it will run nearly through the centre of the French dolmen district.²⁷ There are some fine dolmens in Corsica, and they abound in western Spain and also along the coast of Portugal. Then the line of dolmens runs along the southern shores of the Mediterranean. Dolmens are found in Morocco, and in Algeria, in which country they are even more numerous than in France.²⁸ They are found also in Tunis and in Tripoli. There are none in Egypt, but in Palestine they occur in the land of the Ammonites beyond the Jordan.²⁹ A few dolmens are reported in northern Arabia, and

22. That is, along the coast of Africa which forms the southern shore of the Mediterranean Sea.

23. *La France Préhistorique*, pp. 191, 192.

24. *Journal of the Anthropological Institute*, vol. vi (1877), pp. 166-177.

25. Nearly 200 dolmens are known in Ireland. Mortillet, *Le Préhistorique*, p. 533, and *Descriptive Catalogue of the Antiquities in the Museum of the Royal Irish Academy*, by Sir W. Wilde.

26. *Journal of the Anthropological Institute*, 1872,

27. There are branches to the east and west of this line, but there are few dolmens of importance to the east of the Rhone. Some occur in Switzerland.

28. Mr T. W. Flower describes these in the *Norwich Report of the Congress of Prehistoric Archaeology*, pp. 194-216.

29. *Heth and Moab*, by Capt. Conder, p. 222, &c.

many are found in western³⁰ and north-eastern India.³¹ Here the dolmen-line ends. There are, however, isolated groups in Circassia, the Crimea, and near Odessa. There are none in Africa south of the Barbary States, and none in central or northern Asia, nor are they found in eastern Europe. Nor do any occur in North America, and in South America their existence is doubtful.

The first thing that we learn from a study of their distribution is that the builders of them entered Europe from the south by way of Spain and the Straits of Gibraltar, and not from Asia; for there are no dolmens in central or eastern Europe. Consequently, they could not have been Celts, nor any other members of the Indo-European or Aryan family, for we know that the Aryans came from Central Asia, and entered Europe from the east.³² This conclusion is most important.

In Europe most of the dolmens are found near the coasts, and they become fewer as we proceed inland, until in central Europe they cease altogether. The dolmen-builders, therefore, loved the ocean, and had their principal settlements near its coasts, and along its shores.³³ France may seem to supply an objection to this idea, as many dolmens are found far inland, and in the centre of the country. A glance at the map will, however, show that the dolmen-builders had at the first two great settlements in France, one in Brittany and the other near the head of the Gulf of Lyons. From these points they extended their monuments inland, until they met in central France, and thus the French zone of dolmens, reaching right across the country, was formed.

Further, we learn that the builders of the dolmens must have possessed vessels, and have been acquainted with the art of navigation, because many dolmens are found on islands far out in the middle of the sea. It is true that Ireland, which is full

30. *Norwich Report*, pp. 240-256. By Sir William Elliot.

31. *Transactions of Anthropological Institute*, vols. i, pp. 122-140, and v, pp. 37-41. Papers by Lieut.-Col. Godwin-Austen.

32. This conclusion has been disputed by Penka and by Latham, but Professor Keane maintains (*Stanford's Compendium of Geography-Europe*, pp. 557, 558), that the old idea is still correct.

33. Such in the opinion of Col. Lane-Fox expressed in *Transactions of the Ethnological Society*, 1869, p. 62.

of dolmens, might have been easily reached from Scotland, and I will not dwell on the fact that many dolmens in Brittany stand on islands, because the Breton coast has been sinking ever since the Roman conquest of France. Nor will I refer to the dolmens in the Channel Islands, for tradition says that Jersey was in the time of Julius Cæsar so closely connected with the mainland that only a plank was needed at high water to cross the space between them.³⁴ But these reasons will not explain the presence of dolmens in Corsica, which is 50 miles from land and surrounded by deep water; nor their occurrence in the island of Bahrein in the Persian Gulf, which is at a similar distance from the shore. To reach these islands the dolmen-builders must have had vessels of no small size, and able to make lengthy voyages.

It is true that there are breaks and gaps in the dolmen-line but these can be easily explained. In regions where the soil consists of sand or clay no large stones could be obtained but, as Sir John Evans has pointed out,³⁵ this must be stated carefully. Thus, in Northern Prussia the soil is sandy, but the country is covered with large erratic boulders, which are derived from the Scandinavian mountains,³⁶ and which would furnish excellent material for the construction of dolmens. The coast-line, also, has changed in many districts, land having been raised in some regions,³⁷ and depressed in others. The gaps in the dolmen-line, however, are better explained when we realise the maritime character of the dolmen builders. Their settlements (like those of the Phœnicians) were at isolated points, because they coasted along the shores and only penetrated inland occasionally, when they settled for a long time in a particular district.

In connection with the geographical distribution of the dolmens we may notice the remarkable trilithons,³⁸ resembling those of Stonehenge, which occur in many countries. The extraordinary megalithic monument of Hhagiar Khim in

34. *Stanford's Compendium of Geography—Europe*, pp. 59, 60.

35. *Journal of the Anthropological Institute* vol. iv. (1875) p. 348.

36. *Geikie's Prehistoric Europe*, pp. 171, 172.

37. As is the case in land near the mouth of the Rhone. See *The Mediterranean*, by Admiral Smyth, p. 13.

38. Formed of three gigantic stone slabs—two uprights and a cross piece laid over their tops.

Malta is a good specimen of such constructions,³⁹ for in it trilithons and gigantic stones, stand and lie together. Dr. Barth also⁴⁰ found trilithons in Northern Africa, in the borderland of Tripoli and Fezzan, which he ascribed to the Berber race. More extraordinary is the great stone circle, seen by Palgrave,⁴¹ in Central Arabia, which he said reminded him of Stonehenge. The Arabs had not the slightest tradition of its origin and told Palgrave that there were other similar monuments in the neighbourhood. Equally wonderful are the two gigantic trilithons on the island of Tongataboo in Polynesia. They are constructed of a stone not found in the island, and have no ruins near them. The uprights of one of these are 30 feet in height, and the cross slab at the top is 26 feet in length. The uprights of the other are 16 feet high, and the block which covers their tops is 24 feet long. The natives of Tongataboo know nothing of their origin, and ascribe them to the Supreme Being.⁴²

Another proof of the great antiquity of the dolmens in Europe is found in the fact that dolmen building in Europe had ceased before the beginning of written European history. I do not mean that no notice of their existence may be found, but that there are no references to any races building dolmens at the time when our oldest histories were written. We have excellent histories and geographical treatises written by Greek and Latin authors, which describe at length the manners and customs of many barbarous races in Europe, but these works contain no reference to dolmens being erected at that time; evidently this is because such were no longer built, for the work of raising so many erections of great size would have involved the labour of vast multitudes of men in many countries in Europe, and

39. See Dr. Leith Adams' *The Naturalist in the Nile Valley and the Maltese Islands*, pp. 239-247, also the *Report of Norwich Congress of Archaeology*, 1868, pp. 406-416; and *Journal of the Anthropological Institute*, vol. iv. (1875), pp. 92-99. These ruins have, without due reason, been assigned to the Phœnicians, and from their resemblance to Stonehenge a Phœnician origin has also been ascribed to Stonehenge!

40. *Travels in Northern and Central Africa*, chap. iii.

41. *Travels in Central and Eastern Arabia*, vol. i., pp. 251, 252.

42. One of these trilithons is figured and described in *The Illustrated London News*, for March 10th, 1860. M. de Quatrefages also describes both at length, and gives illustrations of them in his work *Hommes Fossiles et Hommes Sauvages*, pp. 255-260.

this would certainly have been reported to the classical authors. Truly, therefore, our dolmens may be said to be prehistoric. Such historians as Tacitus and Cæsar would surely mention the building of dolmens if it had occurred in their day but, although the former describes the manners of the Germans, Caledonians,⁴³ Fenns,⁴⁴ and others, and the latter gives an account of the Gauls and Britons, I do not know any passage in which either of these authors mentions the building as then occurring. Let us picture what must have taken place in Central France at the era when they were erected. Thousands of men must, year after year, have been engaged in drawing and placing and fashioning gigantic blocks of stone, and great assemblies must have always been taking place. The Romans, if they were then in France, must have seen all this, yet they never once mention these wonderful occurrences, which clearly proves that dolmen building had ceased long before France fell under the dominion of Rome.

As our dolmens are truly prehistoric, they may also be said to be pre-traditional, for not a single tradition can give us any rational account of their origin. By whom do the old traditions of Europe declare that they were erected? By elves, dwarfs, fairies, giants, goblins, and later traditions assign them to the saints, and even to the devil.⁴⁵ This proves that the oldest traditions that have come down to us do not go far enough back to reach the builders of the dolmens. We have amongst us traditions, habits, customs, and practices, which are, certainly, pre-Celtic, and cannot be assigned to any Aryan source.⁴⁶ But even these give no account of the erection of the dolmens clearly, because when our oldest traditions originated the builders were absolutely unknown.⁴⁷ In Brittany, so complete has ever been the ignorance of the peasantry about the origin of the dolmens that they are often said to date from the creation of the world. When questioned as to their origin, the Breton

43. *Life of Agricola.*

44. *Manners of the Germans*, chap. xlvi.

45. In India and Circassia many dolmens are assigned to the dwarfs.

46. An interesting account of these customs is given by Mr. Elton in his *Origins of English History*, chaps. vii., viii.

47. It is curious that in Central France dolmens are assigned to unknown races, the names of which are preserved by tradition. The names are strange. Are these really the names of vanished races?

peasants will sometimes answer—"You ask us who raised these monuments? we reply that, when God made the world, He put the stones there exactly as you see them now."

The contradictory nature of these traditions shows that no light can be obtained from this source. Our dolmens were as great mysteries to the men amongst whom the oldest traditions originated as they are to us.

After what has been said, it will be evident that the Celts had nothing to do with the building of the dolmens. These erections abound in regions into which the Celts never entered. The most ardent Celtic champion will not maintain that the Celts lived in Algeria, Palestine, or Japan,⁴⁸ and yet dolmens occur in all these countries. Moreover, the Celts entered western Europe from the *east*, but there are scarcely any dolmens along the line of the Celtic invasion, and we have found that the dolmen builders came into Europe from the *south* by way of Northern Africa. The Celts, themselves, had no traditions giving any account of the building of dolmens and were quite ignorant as to their origin. Curious proof of the ignorance of the Celts on the origin of these megalithic structures is found in the decrees of some of the Church Councils in Gaul.⁴⁹ These ordered that the dolmens and menhirs should be destroyed, because the Celtic Christians worshipped them. It is plain, therefore, that they were utterly ignorant of their origin. The idea, therefore, that the Celts had anything to do with the erection of our dolmens must be abandoned, and this implies that these were not raised by any members of the Indo-European, or Aryan, family.

The mechanical power and constructive ability shown in the formation of many of these dolmens are often very remarkable. We consider our Cornish examples fine, but they are insignificant when compared with those in France. The capstone of the one at Zennor is 18 feet long; that of Lanyon is of the same length; that of Trevely has a length of 14 feet; and the capstone of Chywoone dolmen is 13 feet long; but in Brittany these dimensions are greatly exceeded. Thus, the capstone of the dolmen

48. For a notice of the dolmens in Japan and an account of those in Corea especially, see *Journal of the Anthropological Institute*, vol. xxiv., 1895, p. 316.

49. Such as the Councils of Arles (A.D. 452), of Tours (A.D. 567), and of Nantes (A.D. 658).

of Crusano is 24 feet long, and that of Bier Groah is 34 feet long, while one of the stones of that near Saumur, in the department of Maine et Loire, attains the extraordinary length of 71 feet. These gigantic dolmens throw those of Cornwall quite into the shade. Some of the huge stones of the French dolmens were also brought from great distances. Thus, the great capstone of the dolmen of Saint-Fort-sur-le-Né, in the department of Charente, was brought from a region at least 15 miles distant.⁵⁰ Many other enormous stones have been conveyed 10 miles in order to construct dolmens. How was the transport effected? It is easy to talk of ancient Egypt, and to say how in that country monoliths were dragged by slave-labour or floated down the Nile. But Egypt was a flat and open country, with a broad and gently flowing river. France on the other hand was, when the dolmens were erected, hilly and covered with dense forests. The climate was moist, the soil soft, the valleys were full of marshes, and there were no roads. By what means then were these enormous slabs of stone brought from a distance of 15 miles? Moreover, some of them were actually conveyed *uphill*, that is to say—from a lesser to a greater elevation.⁵¹ This complicates the problem. In some instances also, the capstones are formed of one kind of rock and the uprights of another, both uprights and capstones being brought long distances. In Cornwall we have only granite dolmens, but in France they are built of all kinds of stone such as granite, gneiss, basalt, sandstone, limestone, and even conglomerate.

Whoever the dolmen builders were, I believe that their stay in Cornwall was of only brief duration. I am led to this conclusion because our Cornish dolmens are so few in number. How many does Cornwall possess? Mr. W. C. Borlase⁵² describes only eleven, and the Rev. W. C. Lukis,⁵³ does not think it necessary to notice more than seven. In France, however, matters are entirely different. In Brittany, which is about three times as large as Cornwall, there are nearly six

50. *Memoirs sur Les Restes d' Industrie de la Charente*, by A. de Rochebrune, p. 94.

51. Mortillet—*Le Préhistorique Antiquité de l' Homme*, p. 595.

52. *Nenia Cornubiæ*, pp. 16-69.

53. *Prehistoric Stone Monuments of Cornwall*.

hundred, and in the department of Aveyron, little more than double the size of Cornwall, the number is four hundred. This proves that, while the dolmen builders lived in France a long time, their stay in Cornwall was of an extremely brief duration. Had their sojourn in Cornwall been lengthy they would have spread all over the west of England, and every part of Cornwall would have been covered with their monuments, but this is not the case for even on Bodmin Moors, where a magnificent accumulation of granite blocks is found, I do not know a single standing dolmen. Such facts prove that the dolmen builders only visited isolated districts in Cornwall, and remained there but a short time. Indeed, I should be inclined to imagine that they were colonies either from France or Ireland and, having stayed a short time in our county, they returned to their original home. This, also, is another proof that the builders of our dolmens could not have been the Celts. We know, from historical evidence, that the Celts must have been in Cornwall before the Anglo-Saxon conquest of our county for, at least, 1,500 years, and for how much longer, we do not know. They spread all over Cornwall and penetrated to every part and, had the dolmens been raised by them, they would have been as numerous as the barrows and hut circles.⁵⁴

And now we may ask by whom were they erected? They were not built by the Celts, and it is generally maintained that the Celts introduced the use of bronze into Britain.⁵⁵ It follows, therefore, that our dolmens were erected during the Neolithic period, a time when metals were unknown in Britain.⁵⁶ Moreover, they must have been built in the early part of the Neolithic Age, for had they been raised at the end of that era the invading

54. The fact that many dolmens must have been destroyed by the progress of cultivation cannot be advanced as an argument against this conclusion, for there are extensive moorlands in Cornwall on which the dolmens would still be standing in numbers if the dolmen builders ever penetrated to the districts.

55. *Early Man in Britain*, by Professor Boyd Dawkins, pp. 343, 366. See also a lecture delivered before the Royal Institution, by Dr. J. G. Garson, on "Early British Races," and reported in *Nature*, Nov. 22nd, 1894.

56. I am pleased to find that this conclusion is in harmony with that of Mr. R. N. Worth, who assigns the dolmens to the Neolithic Age. *Journal of the Royal Institution of Cornwall*, vol. xii., p. 94. Mr. Worth also says that the dolmen builders spread along the north coast of Africa, and entered Britain long before the Celts or the Saxons—*Journal of the Royal Institution of Cornwall*, vol. xii., p. 203.

Celts would have seen their erection, and would have had some knowledge of their building, but this is not the case. The builders of the dolmens, therefore, must have belonged to the Turanian family but to which special division of this family we are quite unable to determine. These Turanian dolmen builders must, as already remarked, have been a maritime and sea-loving people.

The curious markings on some of the French dolmens may have been intended to represent the waves of the sea,⁵⁷ which a sea-faring people would love to represent. The existence of such a people in the early part of the Neolithic age, who, though ignorant of metals, possessed vessels large enough to make long voyages may seem somewhat improbable. We must, however, remember that the natives of Polynesia when ignorant of metals were able to make similar voyages in canoes constructed with stone hatchets. Thus, the Maories of New Zealand, when in a stone age and ignorant of metals, left the island of Rarotonga and voyaged for 1,600 miles, in a fleet of great canoes, to New Zealand, which they colonized in the 15th century.⁵⁸ It must be remembered also that these Maories are Turanians and members of the same branch of the human family as that to which the builders of the dolmens probably belonged. The dolmen builders, therefore, might have constructed large vessels with stone tools and like the Maories might have taken long voyages across the sea during their migrations.

What became of these Turanian dolmen builders? They departed mysteriously, for I do not think that there is any evidence to show that they were amalgamated with later races. Why they disappeared and what happened to them we cannot even imagine. A remarkable parallel to their voyages and disappearance is presented in Polynesia. In many of the groups of the Polynesian islands, such as the Carolines, the Marquesas, the Sandwich, the Isle of Tinian, and Easter Island, gigantic walls, earthworks and rude stone statues and monuments have

57. *Formation de la Nation Française*, by M. de Mortillet, pp. 167, 168.

58. *Hommes Fossiles et Hommes Sauvages*, by M. de Quatrefages. pp. 406, 474 also *Polynesian Mythology*, by Sir George Grey, p. 134.

been discovered.⁵⁹ The natives now inhabiting these islands know nothing of the origin of these structures, and regard them with superstitious awe. These wonderful erections were raised by a vanished race, which, possessing vessels, passed from island to island and then mysteriously disappeared. Were these unknown Pacific voyagers connected with the dolmen people?⁶⁰ and did the European dolmen builders pass the Southern Ocean, and disappear by dying out in America? We cannot say and it is useless even to conjecture.

Be this as it may, the dolmen builders are gone for ever. Peasants declare that they may still be seen, at break of day, moving around the great grey stones of the dolmens, but as the daylight becomes stronger they disappear. Theorists affirm that they will appear in races degraded at present, when these shall reach a certain stage of civilization; and even some men of science maintain that their descendants are still living as the Khasias of Assam, or the Kabyles of Algeria. But these are all idle fancies. The dolmen builders have passed away. Long ages ago they departed from the shores of Northern and Western Europe, and the mighty stone monuments which they raised on moor and headland are now memorials of a vanished race and mysteries to men of science.⁶¹

59. An excellent summary of the ruins on these islands is given by Mr. J. H. Lamprey in *The Report of the Norwich Congress on Prehistoric Archaeology* (1868) pp. 56-69. A good account of the structures on Easter Island is given in *The Smithsonian Report* for 1889. In *Cassell's Magazine* for July, 1890, will be found some interesting drawings of the ruins on various Polynesian Islands.

60. *Journal of the Anthropological Society*, vol. vi. (1877), p. 6 and note.

61. The Neolithic age of the dolmens has also been most strongly supported by Mr. J. Romilly Allen in *Archæologia Cambriensis*, vol. xvii. (5th series) 1900.

REPORT ON PORTRAIT OF ANTHONY PAYNE, PAINTED BY
SIR GODFREY KNELLER (1646-1723).

This portrait was placed in my hands by the Council of this Institution in October, 1902, for cleaning.

In Gilbert's "History of Cornwall," vol. I, the frontispiece is a mezzotint of the above portrait, engraved in 1816 or 1817 (Gilbert's History was published in 1817) by Mr. Young at the British Institution, Pall Mall. By comparison I noted that the halberd-top was quite different in the engraving and the painting. I therefore commenced to clean this portion and found that since the engraving was made the picture had been re-painted. This work I entirely removed, and found underneath, in good condition, the original work of Kneller. In vol. X of the journal of this Institution is an article on this portrait and an account of Payne, with a poor engraving made from a photograph of the picture taken by Mr. Argall of Truro in 1890, where can be seen the shape of the halberd-top which I removed. Mr. Argall has fortunately preserved the negative, which clearly shows the shape of the halberd when the picture was brought to me. The cleaning of this portion revealed the fact that the whole picture had been shamefully treated by some one, who had, in addition to badly painting several parts, covered the whole picture with a coat of varnish to which had been added some brown matter, probably oil-colour, thus giving the picture an old appearance, but effectually covering up all the beautiful original work.

There is no doubt whatever that this work had been done since the restoration which Mr. Gilbert had made by Mr. Parker as mentioned in Sir John Maclean's notes on C. S. Gilbert, Journal R.I.C., vol. 6, page 348; otherwise the halberd-top would have appeared different in Mr. Young's engraving. That Mr. Parker's restoration was not a complete one may be seen from the background on the right-hand side of the figure, where I have disclosed the shape of the end of the gun, the rocky and

grassy formation of the distant land ; and, more interesting still, a distant church tower and roof, which is, doubtless, Charles' Church, Plymouth.

In Young's engraving this background is represented as rock-strata only with but little form. He also shows eight cannon balls wrongly placed, as will be seen from my restoration.

On careful examination I next noted that on the painting were three stripes of black braid continued up the front of the costume from waist to cravat ; also one stripe from the centre of the figure to the left side. The hair lacked any drawing, colour, or modelling ; in fact, looked like a dark brown wig, spoiling the contour of the face.

Finding that these details were not in Young's engraving, I commenced cleaning carefully, and found *underneath* all the original colour and modelling of the hair ; and the stripes of black braid, which proved to have been added, quickly vanished. Beyond Drake's Island in the distance I also removed a large piece of distant land (shewn in Argall's photograph) which also had been painted in. Also, not shewn in Young's engraving, I found a part of the knickerbockers below the scarlet costume ; some fancy stitching on the left stocking, and excellent modelling in the legs ; and also the silver buckles on the shoes, which proved to have red soles. The general modelling of the costume comes out after cleaning, much the same as in Young's engraving, as does also the sky, which, when the picture came to me, looked like a dark brown wooden background almost without variety of colour or modelling, and now a stormy and dark purplish-blue sky is revealed with gleams of orange light breaking through. The tow-rope round the top of the halberd (intended for lighting the gun-fuse) is also revealed as smouldering.

My work revealed the picture in its original state as described by Parker, namely "full of cracks and holes, the result of having been rolled up." In this condition it was photographed by your curator, Mr. G. Penrose.

It is with great pleasure that I can report on the excellent state of preservation of the picture in spite of its many misfortunes. Sir Godfrey Kneller had prepared the canvas with a beautiful ivory-like groundwork for painting upon, and to this we

are indebted for the excellent condition of the colouring at the present day. . Fortunately, the face was the least damaged part of the whole picture, and its characterisation is excellent, the modelling being sound and firm, and the colour beautiful. Even Young's engraving of the face is a libel on the painting.

When the picture was brought to me, every part was more or less besmeared with paint and varnish, with none of Kneller's work visible in any part. And now, but for those few and very small parts which it was necessary to re-paint, the picture stands in all its original condition, as one of the masterpieces of that artist.

To one other fact I would call your attention, namely, that since Young's engraving was made, the picture has been considerably cut down as will readily be seen by comparing the picture with the engraving. By scaling both, I find that five inches have been cut from the bottom ; six inches from the top ; four and a half inches off the right side, and six and a half inches off the left side. The canvas was, therefore, originally nine feet by six feet, and now is only eight feet one inch, by five feet one inch.

My work has extended over about six months ; I am indebted to you for the privilege of restoring such a masterpiece, and must congratulate you on the possession of such a very fine work of art.

Yours faithfully,

W. A. ROLLASON.

To the Council of the Royal Institution
of Cornwall, Truro.

3rd December, 1903.

NOTE.—The cost of this restoration was defrayed by Sir Robert Harvey, the donor of the picture to the Institution.—*Ed.*

THE PRECIOUS METALS IN THE WEST OF ENGLAND.

By J. H. COLLINS, F.G.S.

GOLD.

The remark has often been made that if the West of England mineral region had been specially searched for gold this metal would probably have been found in paying quantities in many places; and the further remark has been hazarded that our laws, by which gold and silver are reserved to the Duchy of Cornwall or the Crown instead of being held the property of the ground landlord, are, in some degree at least, the cause of the neglect to search for such metals. This latter contention at any rate does not seem to be well-founded.¹

As to the first remark, what follows may help us in arriving at a just conclusion.

It is matter of common knowledge that particles of native gold have been found in most, if not all, of the alluvial gravels of the West of England (now almost completely exhausted) that have been worked for tin. Thus Carew, writing in the reign of Queen Elizabeth, says in an oft-quoted passage "Tynners doe also find little hoppes of gold amongst their owre."² And Beare about the same time says "Two blocks of tin . . . carried to Bordeaux in Queen Elizabeth's time were valued to be worth all the rest of the tin there by reason of the gold contained in them."

So far as is known, the largest piece of gold yet found in the West of England is specimen No. 112 from the Rashleigh collection recently acquired by the Royal Institution of Cornwall. Unfortunately the quartz formerly attached to this specimen has been carefully picked out: it still weighs 1 oz. 18 dwts. 8·6 grains.

¹ It is common experience that the Crown and Duchy have always been considerate landlords, much more so indeed than the private owners.

² Survey of Cornwall, p. 7. Quoted by De la Beche, Rep. V. 613.

The earliest note of the presence of gold in our stream tin of which the writer is aware is that of Carew (1602), who quotes from Mr. Beare's *Bayliff of Blackmore*, written in the reign of Queen Elizabeth to the effect that "certain glorious corns" of gold called "Bux" were taken out of the washed tin found at Castle Park, near Lostwithiel. The gentleman who shewed this gold shewed also a gold ring on his finger made of certain gold hoppes which he had gathered amongst the tin corns at a wash in a stream work, together with another gold ring, each of 16s. 8d. value.³

"Three quarters of an ounce of gold culled from amongst the stream tin ore of his domain in North Hill, was by direction of Mr. Spoure (who died in 1696), made into a signet ring which has descended as an heirloom in the family of Rodd of Trebartha.⁴

In 1702 "Queen Anne granted a patent to Mr. Thos. Lydall, of Truro, for separating gold and silver from tin in a reverberatory furnace,"⁵ perhaps a sort of first anticipation of the "bottoms" process since used extensively for separating gold from copper.

"In 1753 some persons of the parish of St. Stephens' Branel streaming for tin in the parish of Creed, and perceiving some grains of a yellow colour very small but yet so heavy as to resist the water (in washing), culled out some of the largest grains and carried the tin to a melting house in Truro. The gold was in such plenty in this tin that the melter, Mr. Walter Rosewarn, taking the gold at first for mundie or copper, blamed them for bringing it for sale without having first burnt it; but upon assaying the ore found it to make a very great produce and exceedingly fine metal; the miners then took out of their pockets several pieces of pure gold, and one stone as large as a walnut with a pure vein of gold in the middle of the stone about the bigness of a goose-quill; the clear bits of gold and that in the stone were then assayed and produced just an ounce of pure gold.⁶

3. This passage from Carew has been quoted by Tonkin, Pryce, and other subsequent writers.

4. Henwood Pres. Address to the Royal Institution of Cornwall, 1873. *Journal R.I.C.*, vol. IV, p. 231, *note*.

5. Borlase, *Nat. History*, 1758, p. 214.

6. Borlase, *Nat. History*, 1758, p. 214.

“Mr. Rosewarne . . . has now by him one piece of fine gold . . . weighs to the value of twenty-seven shillings, another seventeen shillings . . . has seen two bits from Probus which weighed about fifteen shillings intermixed with quartz. I have one which weighs half a guinea . . . but the largest piece found in Cornwall which has reached my notice is that in the possession of Wm. Lemon, Esq., of Carelew, brought him in the latter end of September, 1753, which weighs fifteen penny-weights and sixteen grains. It appears to have come from a vein half an inch wide at a medium. On each side it has a light brown fatty earth which is the only impurity.”⁷ From the rough sketch given by Dr. Borlase I should judge that this is the specimen referred to by Mr. Michell in the year 1828. “A piece of gold in a matrix of quartz from Carnon Vale (now in the Royal Institution of Cornwall), weighs 11 dwts. 6 grains.⁸ If so this is specimen No. 1025 of the old Truro collection. The difference of weight may be readily accounted for as a result of the former unfortunate practice of breaking away the adhering stony gangue as far as possible.

In the Manuscript Additions to Borlase’s Natural History we find the following :

“The present Mr. Glynne, of Glynne, has shewn me a large gold seal ring made of gold hoppers found in the river under his house. I have also two small pieces, found in a stream work near the church of Cordynham, not far from Bodmin.⁹

“The stream tin obtained at Treloy (St. Columb Minor), was frequently mixed with grains of gold mostly about the size of wheat, but sometimes as large as peas.”¹⁰

Klaproth writing in 1787, says “The stream tin from Pensagilgas is remarkable on account of the native gold which now and then is met with in it, and found, though very rare, in pieces of the value of two or three pounds sterling.”¹¹

7. *Ibid.* figured in plate xxi, fig. xxv.

8. *Man. of Min.*, Truro, p. 2.

9. See *Jour. R.I.C.*, 1 Supp.

10. Nicholls, quoted by Henwood, *Pres. Add.*, *Journal R.I.C.*, IV, p. 219.

11. Quoted by Henwood, *Ibid.*, p. 237.

“Some five and thirty years ago whilst examining a small parcel of stream tin-ore brought from this district (the valley of the Cobar, near Helston), I found amongst it a lump of gold nearly if not quite as large as a pea.”¹² Mr. Henwood also quotes Capt. Joseph Knight as follows: “In a stream-work conducted by me on the river Camel, a good bit of gold was found mixed with the tin-ore.”¹³

A great many other pieces weighing from a few dwts. up to half an ounce or more have been found, particulars of some of which are noted in the following table :

TABLE 1. *Specimens of native gold found in Cornwall or Devon, and known to be in existence at the present time.*

Weight			Description	Where found	Remarks
ozs.	dwts.	grs.			
1	18	8·6	Large smooth nugget from which quartz has been picked out	Carnon Stream Works	No. 112 of Rashleigh collection now in the Truro Museum
0	10	3·1	Nugget with embedded fragments of quartz	St. Ewe	Rashleigh collection do ditto ditto
0	7	2·2	Nugget with some quartz	Cornish Stream Works	ditto ditto
0	8	9·2	Nugget, quartz picked out	ditto	ditto ditto
0	16	3·3	Two large and two smaller nuggets, and some minute fragments	ditto	ditto ditto
?			Minute grains with stream-tin.	Carnon Stream Works	No. 11 ditto
0	11	8	Nugget with embedded fragments of quartz	ditto	Truro Museum No. 1025 This is probably the old Carclew specimen. ditto No. 1026
?			Small irregular fragments	ditto	ditto No. 1026
?			Minute grains in stream-tin	ditto	ditto No. 1027
?			Many small nuggets	Crowhill	Rashleigh collection
?			Two small irregular grains	Cornwall	Camborne Museum, No. 3346
?			Native gold foliated, disseminated in oxide of iron with clay slate (gozzan)	North Molton	ditto No. 3336 ¹⁴ Shews a good deal of gold

12. Henwood Pres. Add., p. 237.

13. Pres. Add., p. 232 note.

14. This is wrongly referred to South Molton on the Museum label. It is no doubt from the gozzan of the old Poltimore copper mine.

TABLE 1 (continued.) *Specimens of native gold found in Cornwall or Devon, and known to be in existence at the present time.*

Weight	Description	Where found	Remarks
ozs, dwts, grs. ?	Foliated particles rather thinly scattered but otherwise as above	North Molton	Camborne Museum No. 3337
?	Scales of gold in quartz	Barnstaple ¹⁵	In the collection of Howard Fox, Esq.
?	Two pieces of gozzan freely interspersed with gold scales	St. Ewe	ditto
?	Nodules and grains of gold, the largest $\frac{1}{4}$ inch in length.	Carnon Stream Works	In the collection of Robert Fox, Esq., at Penjerriek
8.474	Tube containing gold from tin streams.	ditto	No. 60 in the Carne Collection now at Cambridge
?	Tube containing gold and tin ore from tin streams.	Cornwall	No. 61 ditto
?	A few small grains.	ditto	Brooke Collection, Cambridge
12 $\frac{1}{2}$ (nearly).	Waterworn nugget.	Carnon Stream Works	British Museum Collection
?	Grains with stream tin	Cornwall	ditto
?	Crystalline leaf in rock.	ditto	ditto
?	Gold in rock.	ditto	ditto
?	Two small fragments.	Carnon Stream Works	ditto
?	Fragments with quartz	Ladock	Museum of Practical Geology, Jermyn street
10 6	Gold nugget	Carnon Stream Works	ditto
?	Several pebbles of white quartz spangled with gold.	ditto	ditto
?	Gold in rock	N. Tawton	Museum of Plymouth Athenaeum
?	Gold nuggets and waterworn scales, some with quartz attached, the largest probably 2 dwt. of Gold.	Ladock	Penzance Museum, No. 1315, presented by Sir Chris. Hawkins
?	Three minute scales washed out of alluvium by C. Le Neve Foster and H. Francis.	Mudian Vein (Meneage)	ditto No. 1316

15. Probably from the Britannia Mine near North Molton.

It is remarkable how very generally gold has occurred in connection with stream tin in the valleys of Cornwall—scarcely a parish has been without both stream tin and gold.¹⁶ Gold has also been found in the black titaniferous sands of the Manaccan Valley (Meneage), and also in several of the raised beaches. In Devon, too, gold has been found in the alluvial deposits in some of the valleys which originate in Dartmoor.

It has been said that the entire produce (of gold) from the tin stream works of the county of Cornwall “can scarcely have exceeded a few pounds,”¹⁷ but in view of the above-mentioned facts this seems to be altogether too low an estimate. As to the gold actually present originally in the tin-ground, this must have been quite considerable in quantity. In a former work¹⁸ the author has shewn that the amount of black tin derived from the tin gravels of the West of England (mainly from Cornwall) may be reasonably estimated at 750,000 tons. If this ore contained but one dwt. of gold to the ton (surely a *very* low estimate in view of the facts and statements already quoted), we arrive at the very respectable yield of 37,500 oz. This is by no means a trivial quantity, and, even if not more than one tenth of that quantity was ever separated, it suggests that the numerous “Gaulish” gold coins found on Carn Brea Hill more than a century and half ago,¹⁹ as also the gold cups, torques, armlets and other objects found in so many of the pre-historic sepulchres may have been of native origin.²⁰

16. The following may be especially mentioned :—

Advent	Germoe	Manaccan	St. Ewe
Altarnun	Gorran	Northill	St. Just
Baldhu	Illogan	Perranarworthal	St. Mewan
Callington	Kea	Probus	St. Neot
Camborne	Kenwyn	Redruth	St Stephens (in Brannel)
Cardinham	Ladock	Roche	
Chacewater	Lanivet	St. Austell	Stoke Clinsland
Creed	Lanlivery	St. Blazey	Talland
Davidstow	Lostwithiel	St. Breward	Warleggan
Egloshayle	Luxulyan	St. Columb Minor	Wendron
Feock	Madron	St. Dennis	

17. *Henwood*, Presidential Address, *Journal R.I.C.* 1873, p. 225.

18. *Seven Centuries of Tin Mining in Cornwall.*

19. See *Borlase. Antiq.* 1754

20. The gold cup found in a barrow at Rillaton Manor in the year 1837 and now in the possession of the King, weighed 2 ozs. 1 dwt. It is described and figured, *Journal R.I.C.*, Vol. III. In the same volume Mr. Albert Way describes and figures a portion of a gold armlet found at Tredinney, near Penzance, (and now in the museum

It is also worthy of consideration that the fine alluvial matter washed away in obtaining so large a quantity of tin must have contained a good deal of float-gold, part of which could have been saved had the use of mercury for that purpose been known, so that the actual quantity of metallic gold present may have very largely exceeded the estimate given above. Still I do not wish to suggest that these alluvials would ever have paid to work for their gold contents alone²¹ although gold might not infrequently have been a somewhat important bye-product.²²

Gold in the metallic state has been found, but only in small quantities, in several of the cross-courses, and in particular at North Molton, in Devon, at Wheal Sparnon, in Redruth,²³ in Woolf's cross-course in Breage, at Beacon Hill, Falmouth, on the cliffs to the north of Camborne, and at a few other places. It probably exists in many of the cross-courses and perhaps in some of the E. and W. lodes. This will plainly appear from what follows:—

In the year 1840 Mr. S. Moyle reported to the Royal Institution of Cornwall that he and Mr. Percival Johnston had about eight years since "found gold in the pyrites of a mine near Wheal Gorland to the extent of 89 ozs. to the ton, and in five out of seven samples taken from a mine in Perranzabuloe from four to seven ozs. to the ton."²⁴

of the Penzance Antiquarian Society), which was $4\frac{1}{2}$ inches long and weighed 10 dwt. 16 grains. A massive fibula of gold found near the Lizard which weighed $5\frac{1}{4}$ ozs., is also figured in the same volume.

Gold lunettes, or torques, have been found in barrows on several occasions and one is figured by Lysons in his *Magna Brit*; another was found in the parish of St. Juliott; this weighed down eight sovereigns. The most interesting find was that of two torques at Harlyn near Padstow, which are described and figured in the second volume of our journal. The gold in these torques is worth £50; and that amount was paid to the finder by a few members of this institution, so as to secure it for the museum, the Prince of Wales, our present King Edward, having waived his right to them as treasure-trove. Among other finds may be mentioned the chain of gold found by Mr. Davies Gilbert [see his History, Vol. 4, p. 33, Talland.]

21. In very ancient times gold was no doubt the product of slave labour or of the pastime of the women and children having little to do with their time.

22. An analysis of native gold from the St. Austell moors made many years ago by Mr. David Forbes gave gold 90.12 per cent, silver 9.05 per cent, silica and oxide of iron 0.83 per cent.

23. Found by Mr. John Garby, in the year 1845.

24. Rep. R.I.C. 1841 p. 77.

About the middle of the 19th century attention was drawn to gold occurrences at North Molton, in Devon, by Mr. S. R. Pattison.²⁵

In the year 1853 a large number of amalgamation tests were made on a considerable scale on parcels of ore drawn from the Poltimore (North Molton) and Devon United Mines, in Devon ; and also from Great Dowgas, West Polberro, Wheal Jane, West Wheal Jane, Wheal Tremayne (Kea) and other mines in Cornwall, by means of the then newly invented Berdan pan. It was said that no gold was visible in any of the ores treated but very high results were reported from those amalgamation tests, of which the following may be taken as examples —²⁶

Poltimore	1 oz.	12 dwts.	12 grs.	to the ton.
Devon United	1 ,,	5 ,,	0 ,,	,,
West Polberro	3 ,,	19 ,,	8 ,,	,,
Wheal Jane	2 ,,	1 ,,	7 ,,	,,
W. Wheal Jane	2 ,,	6 ,,	16 ,,	,,
Wheal Tremayne	4 ,,	13 ,,	8 ,,	27 ,,

A specimen of gozzan "from Cornwall" which is said to contain 14 ozs. gold and 2 ozs. silver to the ton, is in the Royal Albert Memorial Museum, Exeter.

In 1854 gold was obtained from a trench on the back of the West Tolgus lode.²⁸

25. "But that which has rendered this curious mine [the Poltimore] of great present interest is the gozzan found in the upper portion of the main lodes [the lodes yield copper ore and seem to be of the nature of bedded veins]. On one side of the valley giving 8 dwt. on the other 17 dwt. to the ton - not visible" Pattison, *Trans. R. G.S.C.* VII p. 225.

"About three quarters of a mile from the Poltimore occurs the Britannia works ; these are upon a vein of quartzose metalliferous gozzan .. the vein stone is much mineralized and in some places has quite a granitoid appearance in small patches. It is here that gold in grains was obtained on the surface by Mr. Flexham, of South Molton". [ibid. p. 227]

26. Reported in the *Mining Journal* of December, 1853.

27. It is right to say here that doubt was expressed as to the accuracy of these results at the time, indeed it was freely stated that while the assays themselves were probably correct the samples had been tampered with by parties interested in the sale of the Berdan machines or of the properties concerned. But in view of the previous work of Messrs. Moyle and Johnston there seems to be no ground for such suspicion in these cases.

28. Hambly; *Rep. R.C.P. Soc.*, 1897, p. 100.

Mr. Arthur Dean, writing to Mr. Robert Hunt in the year 1865, said that he had found free gold in paying quantities in the lode at the Great Dowgas mine, "an immense lode from 30 to 60 feet wide, composed of quartz, carbonate and oxide of iron, hornblende, iron pyrites, and blende, with some copper ore and tin ore disseminated throughout the mass. Two samples of 9 cwt. each gave by amalgamation at the rate of $7\frac{1}{2}$ dwt. gold to the ton although no gold was visible in the stone." He goes on to say, "from a large lode near Tavistock (Devon United?) which carries tin on the back in small quantities but makes copper in depth, and in which the mineral near the surface is quartz mingled with hard iron gozzan, I obtained by trial of half a ton at the rate of 10 dwts. per ton," and again "at a few miles from Falmouth there is a very large lode from which a very competent assayer and smelter assures me that he has tried many samples of the mineral as broken and has frequently obtained assays at the rate of $1\frac{1}{2}$ and 2 ozs. gold per ton and has found gold in paying quantities through the mass of the mineral." Mr. Dean adds: I have devoted but a small amount of time to the question of gold in Cornwall but intend shortly to make a practical trial in the county. Twenty-one years ago I was much laughed at when I announced the discovery of a true gold formation in N. Wales, but the facts have turned out in my favour, may my impressions as to Cornish gold be equally correct.²⁹

I believe that these investigations were not carried out by Mr. Dean, but the subject has never been quite lost sight of. Mr. F. J. Stephens has tested the great quartz vein at Beacon Hill, near Falmouth, and found it to contain small quantities of gold, though not sufficient to warrant the erection of plant for its treatment. In a paper read at Penzance a few years since³⁰ Mr. Stephens gives references to many gold discoveries, including, besides those already mentioned, the following:—

Mr. S. R. Pattison, in a quartz vein on Rough Tor.

Mr. N. Whitley, in the raised beach at Newquay.

Capt. Hambly, in the gozzan of Wheal Gorland.

29. Trans. Miners' Assoc. of C. & D. 1865, pp. 19-20.

30. Recent discoveries of gold in West Cornwall. *Trans. R.G.S.C.*, XII, p. 240.

Mr. Hutcheson, in the raised beaches and sands of Godrevy Island.

Mr. F. J. Stephens, in various places between Falmouth and the Lizard; also in the raised beaches of Falmouth and Gerrans bays.

The late Sir Clement Le Neve Foster, while still resident in Cornwall, made a washing test at Mudian Vean in Manaccan, in company with Mr Henry Francis, and found a few spangles of gold in the black titaniferous river sand there.

The occurrences of gold in the West of England are not confined to quartz, iron pyrites, and gozzan; distinct traces are always to be found in the copper ores, and often in the ores of tin, lead and zinc. Capt. Hambly believes also that it exists in the well-known Ladock sandstones and conglomerates, but this suggestion needs confirmation.³¹

SILVER.

Silver is much more abundant than gold in the West of England, for, not only have considerable pockets of true silver ores been often found, but it occurs in paying quantities in nearly all the lead-ores, in many of the ores of copper and zinc, and probably in some of the tin ores; as also in most of the gozzans. Neither native silver nor true silver ores have been found in the tin-stream works, but many rich pockets of such ore, often worth thousands of pounds, have been found in cross-courses near their intersections of right-running veins and *vice versa*, especially in the Hayle, Gwinear, Liskeard, and Calstock districts, as also at several places in Devon. In Cornwall, a piece of native silver, "as big as a walnut," was found at Wheal Cock in St. Just in the year 1753.³² "Fibrous native silver" associated with horn-silver was found at a mine in Perranzabuloe, hence named Wheal Mexico, in the year 1788. In all about £2,000 worth was raised from here, in and above the adit.³³

31. "It is precisely into the valleys traversing the districts named (by DeLaBeche, viz., St. Ewe, Creed. St. Stephens, St. Mewan, Kenwyn and Ladock) that the products of the decomposition of these rocks (the conglomerates) would naturally fall. I have here a gold ring made of metal recently taken from the sand at Portreath beach, which for a depth of 8 to 10 feet has been stripped and washed by my friend, Capt. Evans." (Hambly, Report R.C.P., 1887, p. 99).

32. See Borlase. *Ant.*, 1754, and *Nat. Hist.*, 1757.

33. Carne, *Trans. R.G.S.C.*, 1, p. 121, and *Lysons, Cornwall*, C, CX.

“The next discovery was at Herland in Gwinear in 1799. The silver ore was found in a cross-course, and was richest near the point of intersection of a copper-lode, particularly where this latter was rich in copper ore. It was first seen in the 90 fathom level and continued to the 120. In length its extent was nowhere more than 45 feet, and it gradually became poorer as its distance from the copper lode increased.” The ore was chiefly “vitreous silver ore” (argentite), “arsenicated silver ore” (pyrargyrite or proustite), and “black oxide.” “Some of the latter (called ‘goose-dung ore’ by the miners) contained upwards of 50 per cent. of silver.” The value of the silver obtained at this place was about £8,000, part of the ore was smelted on the mine and the rest sold in Bristol.³⁴

In 1810,³⁵ a discovery was made under somewhat similar circumstances at Dolcoath, but at a depth of 160 fathoms. “Ore to the value of £3,000 was taken out in a short time. Silver ores were again raised from Dolcoath to a considerable extent in 1833 and from North Dolcoath in 1859-60³⁶

In 1812 at Wheal Duchy, near Calstock, a good deal of native silver, ruby silver, and grey and black sulphide was taken from a cross-course running N.E.-S.W., and a cup made from these ores was presented to the Duke of Cornwall. By 1816 the mine had yielded more than £5,000 worth of silver, all from a leader from 1 to 4 inches wide, in a lode varying from 6 to 12 inches. Some detached lumps which assayed 70% for silver were found in the 10 fm. level, where also was a rich leader which extended for three fathoms in length. Silver was also found in the 20 fm. level and later in the 30 fm. level. In 1833 the mine was reopened as Wheal Brothers, when a considerable quantity of argentiferous gozzan was found, which was sold at prices varying from £2 up to £500 per ton. At the 30 fm. level one part of the lode was valued at £500 and even £600 per fm. In three months, at a cost of £567 4s. 9d., no less than

34. Carne, *Ibid*, 122.

35. Henwood. *Trans. R.G.S.C.* VIII, p. 112.

36. It is well-known that Lord de Dunstanville was presented with a service of plate made from the silver ores raised on the Basset estate (Dolcoath) in recognition of his large relinquishments of dues in times of trouble.

£5,847 12s. 8d. worth of silver ore was raised and sold; shares rose from £5 to £1,000, £1,600, even £2,200 each; considerable quantities of silver were raised during the next four months, and £9,000 was paid in dividends. Then followed a call, to the disgust of the shareholders, and the mine was soon abandoned.³⁷

In 1813 a discovery of native silver associated with red-grey and black ores, together with the carbonates of copper, was met with at Wheal Alfred near Hayle. The same year some silver ore was got from a cross-course at Wheal Basset, at the 28 fm. level below adit (38 fm. from surface). Some of the grey ore yielded 600-ozs. to the ton: it is worthy of notice that the galena associated with this ore was not itself rich in silver.³⁸

In 1814 a small bunch of blackish-grey silver ore, together with native silver, arsenical pyrites and spathose iron ore, was found in an E.W. copper lode at the 65 and 75 fm. levels at Wheal Ann, in Phillack.

The Willsworthy copper mine, although actually in Cornwall, is in the near neighbourhood of the Tamar lead mines. The Devon lode here is in general about one foot wide, it courses N.N.E. and underlies to the S.E. about $2\frac{1}{2}$ -ft. in a fm. In the year 1815, in the 10-fm. level, a vein of white and amethystine quartz divided the lode, between this and the foot-wall was a vein of rich arsenical cobalt ore with native capillary silver in a ferruginous matrix, from 3 to 6-ins. wide. From the quartz to the hanging wall was a vein of rich yellow copper ore 6 to 9-ins. The silver continued for two fathoms, the copper farther.³⁹

Wheal St. Vincent, near Calstock, yielded considerable quantities of many varieties of silver ore from a lode which ran parallel to and south of that of Wheal Duchy, and about the same time. This mine was closed in 1824, and re-opened in 1835 as the East Cornwall Silver mine. It was then worked for about two years and yielded 1 ton, 8 cwt., and 14 lbs. of silver ore, containing about one thousand ounces to the ton. It was again worked as Wheal Langford in 1855, and sold in June of that

37. Mining Journal, Oct. 11, 1857, p. 493.

38. Mining Journal, 1851, p. 124.

39. Carne, Trans. R.G.S.C., I, 124.

year 2 tons, 6 cwt., 2 qrs., 6 lbs. of ore for £1184 15s. 9d. besides much argentiferous lead ore.⁴⁰

In 1827, Treskerby and North Downs, near Redruth, yielded small quantities of silver ore which sold for £15 14s. 4d. and £3 4s. 9d. respectively. In 1847-8 a mine on the eastern part of the Wheal Duchy lode, named Wheal Mexico,⁴¹ yielded a good deal of chloride of silver, which was sold at prices varying from £5 to £200 per ton, while some small specimens were sold at £2 10s. 0d. per lb. Wheal Jewel, four miles S.E. from Callington, also yielded native silver in capillary form, together with ruby-silver, argentite and lead and copper ores from a vein rarely more than 4-ins. wide.⁴²

From 1852 to 1855 West Wheal Darlington yielded ores of silver from an east and west lode composed of quartz and slate with yellow copper ore and iron pyrites. At a depth of 40 fathoms from surface and 24 below the sea level the lode yielded chalcopyrite, galena and native silver. During the period named there were sold 309 tons and some odd cwts. of silver ore which realized £3,659 5s. 1d. A small parcel was sold (seven lbs.) at the rate of £5,120 per ton, some, however, only realized £1 per ton, while the average was £11 16s. 8d. 42 tons 10 cwts. 3 qrs. of ore remained unsold when the accounts were made up and it is not known how much this parcel realized.⁴³

In 1859-62, silver ores were raised at the crossing of two lead lodes by an iron lode at Trebiskan Green in Perranzabuloe. In some parts where native silver and vitreous silver were visible the whole mass assayed 10 per cent. for silver. In all nearly 10 tons were sold from this place which realized £1,245 17s. 7d.

In 1861-4 Wheal Ludcott sold 306 tons of silver ore for £22,583 8s. 8d. This was almost all raised from a vein which crossed the main lead lode and from very near the intersection.

In 1862-77 Silver Vein Mine sold $4\frac{3}{4}$ tons of silver ores for £370.

40. *Henwood, Trans. R.G.S.C.*, VIII, p. 115.

41. Not to be confounded with Wheal Mexico in Perranzabuloe.

42. *Henwood, Trans. R.G.S.C.* VIII. D. 116.

43. *Henwood, ibid.* p. 117.

In 1871 the Queen Mine sold 5 tons of silver ore for £421 12s. 8d.

In 1877-9 nearly 242 tons of silver ore were raised and sold from Wheal Newton which realized £6,888 5s. 7d., and in 1880-2 the neighbouring mine of Wheal Fortune (Harrowbarrow) sold $3\frac{3}{4}$ tons for £2,610 0s. 6d. All these mines are in East Cornwall near Callington and Calstock.

In 1877-81 Crinnis and Carlyon sold 30 tons for £977 10s. 5d.

Silver in small quantities has also been raised and sold from Botallack, Levant, Wheal Providence, East Rosewarne, North Jane, Great Retallack, Fowey Consols, the Prince of Wales and many other mines in Cornwall and Devon.

During the year, 1903, over two thousand pounds worth of silver ore has been raised from shallow workings in Perranuthnoe, of which some specimens are reported to have assayed 45 per cent. silver.

In the following table I have set down all the recorded silver ore sales that have come under my notice—from the Mineral Statistics or elsewhere.⁴⁴ A few of the figures have been interpolated by calculation or estimation. Adding sundry small parcels unrecorded, particularly before the year 1853 and allowing for the very heavy smelting deductions of former times, allowing, too, for silver specimens sold by the miners, it is probable that 2,000 tons of true silver ores have been raised during the century from the West of England mines of a sale value of £80,000, and containing not less than half a million ounces of silver.

44. Mr. Robert Hunt began his *Mineral Statistics* of silver ore in the year 1853.

Mine.	Period.	Quantity.				Value. ⁴⁵		
		Tons.	Cwts.	qrs.	lbs.	£	s.	d.
Herland	1799—1801	115	15	3	0	5649	8	0
		[40	0	0	0]	[2350	0	0]
Dolcoath	1810	[60	0	0	0]	[3000	0	0]
Wheal Duchy (Calstock)	1812—1816	[200	0	0	0]	[5847	12	8]
Dolcoath	1833	39	17	2	0	1740	3	2
		[20	0	0	0]	[1300	0	0]
Wheal Langford	1835—6	1	8	0	14	[200	0	0]
		2	6	2	6	1184	15	9
West Wheal Darlington	1852—1855	309	3	1	1	3659	5	1
		42	10	3	0	[500	0	0]
East Rosewarne	1858—59	[4	0	0	0]	243	16	8
North Dolcoath	1858—59	8	6	3	1	919	0	0
		108	13	3	18	3950	0	0
		1860	119	3	3	23	1449	7	11
Wheal Ludcott	1861—4	305	15	3	0	22583	8	8
Trebisken Green	1859—1862	9	14	0	3	1245	17	7
Silver Vein	1862—1877	4	5	1	0	370	0	0
Great Retallack	1863	1	10	0	0	44	15	5
North Jane	1864	51	13	0	0	38	7	6 ⁴⁶
Prince of Wales	1874—8	4	5	0	0	31	8	5
The Queen	1871	5	2	1	7	421	12	8
Treleigh Consols	1878	0	9	2	0	[20	0	0]
Wheal Newton	1877—9	241	16	0	3	6888	5	7
Crinnis & Carlyon	1877—1881	29	12	2	7	977	10	5
Wheal Fortune (Harrowbarrow)	1880—2	3	15	3	14	2610	0	6
		1729	5	3	13	£67224	16	0

45. Assumed or interpolated figures in brackets.

46. This stuff was sold as "silver ore," it was probably gozzan containing both silver and gold, but of very low grade.

But the silver contained in what may be called true silver ores is trivial as compared with that existing in the copper and lead ores from the mines of the two counties. Of copper ores it has been shewn that about $11\frac{1}{2}$ millions of tons have been sold between 1501 and 1900, averaging probably $2\frac{1}{2}$ ozs. silver to the ton, this represents therefore no less than $28\frac{3}{4}$ million ounces of silver. Of course only a very small proportion of this was ever separated by the smelters, yet it was there, and might have been profitably extracted by known methods.⁴⁷

The lead ores of the West of England have usually been rich in silver. In a paper lately printed I have shown that it is highly probable that not less than 560,000 ounces of silver have been raised from our West Country lead mines.⁴⁸

Taking all this into account, remembering too the silver of our gozzans and indeed of almost all the ores raised in our ore-region,⁴⁹ the silver contents of such ores mined and sold during the past six centuries can hardly be estimated at less than forty millions of ounces, or over 1300 tons of metallic silver.

It is evident, however, that the district as a whole can neither be regarded as auriferous or argentiferous in the ordinary sense of the term; in other words gold and silver may prove to be important accidental or bye-products, but nothing more. It is admitted that our statistics of precious metal production are very imperfect, but yet the whole yield of these metals from the West of England since mining began can hardly have been as great as the yields respectively of a single gold or silver mine of the first rank. Still, bearing in mind all these circumstances, it is quite natural that suggestions should have been put forward from time to time, as to the advisability of systematically working our mines for the precious metals. In the year 1896, at the

47. One instance has been cited where from the copper ores of a single mine in East Cornwall, the smelters obtained £60,000 worth of silver, say 240,000 ounces, for which they paid nothing to the mine.

48. See Notes on the principal lead-bearing lodes of the West of England. Trans. R.G.S.C. XII. pt. VIII. 1902. In this paper mention is made of the silver cup presented to the Lord Mayor of London by Sir Bevis Bulmer in the latter part of the reign of Queen Elizabeth, the silver for which was obtained at the Fayes Mine in N. Devon.

49. The iron ores of Perranzabuloe and of Trebarvah, in Perranuthnoe, have often been found to contain silver up to 7 ounces per ton, so also the blende of Wheal Trannack and other places. Some of the vein-stones also are distinctly argentiferous.

annual meeting of this Institution, Mr. Richard Pearce, who has had a large experience in connection with the smelting of copper and the precious metals in the United States, recommended systematic prospecting for gold and silver in the West of England to a much greater extent than has ever yet been done.⁵⁰ One would not perhaps be sanguine of success as regards free gold, but certainly the crude concentrates from most of our vein-fillings deserve to be tested on an extensive scale. Of course this would necessitate a removal of some restrictions as to modes of treatment and of sale in some of our mine leases, and also the general adoption of the principle of paying dues only out of profits, instead, as hitherto, out of the gross sale value; but I do not think these difficulties should or would prove insurmountable in most instances.

50. See Journal R.I.C. XIII, p. 195.

ON THE MARINE FAUNA OF THE ISLES OF SCILLY.

BY EDWARD T. BROWNE and RUPERT VALLENTIN.

PART I.

THE PELAGIC FAUNA.

BY EDWARD T. BROWNE.

Introduction.

The Isles of Scilly occupy an excellent geographical position for the study of Marine Biology, as they are about thirty-five miles westward of the southern extremity of Cornwall.

Our knowledge of their Marine Fauna is not very extensive, and it is strange that they have been so seldom visited by marine naturalists, as they are so accessible from Penzance.

Their exposed and isolated position gives a distinct advantage to plankton investigations over dredging and shore work. They are in the midst of a good tidal stream, and are most favourably situated for currents, especially those produced by westerly or south-westerly winds. As the prevalent wind is south-westerly, it produces not only a very mild climate in winter, but, at times, a current known as Rennell's Current, which brings inshore the pelagic inhabitants of the Atlantic Ocean. It is these "visitors" to our shores, or the expectation of them, that gives a fascination to plankton work and prevents it from ever becoming monotonous.

The records of the pelagic fauna in this report are based upon two visits to the islands, and as they were far apart it will be best to keep their records separate.

THE FIRST VISIT, 21st to 26th July, 1899.

Mr. J. W. Woodall kindly invited Dr. E. J. Allen, Mr. W. I. Beaumont and myself for a scientific cruise among the islands in his steam yacht "Vallota." The yacht was a great advantage, as we were able to explore the numerous channels between the islands and to find quickly the places most suitable for tow-netting and shore-work. The investigation of the plankton, perhaps unfortunately, fell to my share and consequently the Medusæ received more direct attention than the other groups.

On this visit I particularly noticed the advantages of the New Grimsby channel, between Tresco and Bryher, for tow-netting. It is a sheltered spot and suitable for working in a small rowing boat. The tide flows with sufficient force to keep a net extended from a boat at anchor. This channel can be reached in a few minutes from the little harbour on Tresco.

During this short visit the sea was calm and the weather very fine and warm. A silk net was used having a mesh of half a millimetre. No attempt was made to record all the animals caught in the net. A complete list of the Medusæ is given, and the names of a few other animals which happened to be known to me.

INFUSORIA.

Noctiluca miliaris. This protozoon was very abundant. A great shoal existed, forming one of the characteristic features of the plankton. *Noctiluca* occurs at times in such vast numbers as to discolour the sea. It would be interesting to know if such shoals are only formed during a long period of very fine weather when the sea becomes calm and high in temperature.

Ceratium tripos. Common, but the mesh of the net was not fine enough to catch any quantity.

HYDROMEDUSÆ.

ANTHOMEDUSÆ.

<i>Amphinema dinema</i> (Péron et Lesueur). Fairly common. Mostly adult specimens with ripe gonads.	<i>Larsabellarum</i> , Gosse. Scarce. Only early stages were found.
<i>Amphinema</i> , sp? One specimen	<i>Lizzia blondina</i> , Forbes. Fairly common.
<i>Corymorpha nutans</i> , Sars. Few specimens.	<i>Margelis autumnalis</i> (Hartlaub). Few adults.
<i>Dipurena halterata</i> (Forbes). One adult specimen.	<i>Sarsia gemmifera</i> , Forbes. One specimen.
<i>Euphysa aurata</i> , Forbes. Very scarce.	<i>Tiara pileata</i> (Forskål). One specimen of an early stage.
<i>Gemmaria implexa</i> (Alder). Fairly common. Some early stages, but mostly adults with ripe gonads.	

LEPTOMEDUSÆ.

Euchilota pilosella (Forbes). Two small specimens.

Laodice calcarata, Agassiz. Common.

Chiefly very early stages without gonads and some intermediate stages with gonads appearing. Umbrella 2—7 mm. in diameter. No adults. One specimen with the parasitic *Halcampa*.

Obelia nigra, Browne. Few adults.

Obelia lucifera, Forbes. Few adults.

Phialidium buskianum (Gosse). Common. Early to adult stages.

Saphenia mirabilis (Wright). Three specimens. Gonads well developed. Umbrella 7—9 mm. in diameter.

Altogether 17 species of Medusæ were taken within the week. All are known to occur in the English Channel, and all were taken during that summer at Plymouth. It was not a good summer for Medusæ. The result of seven weeks' work at the Marine Biological Laboratory at Plymouth only yielded five additional species, viz. :—*Sarsia prolifera*. *Irene* sp.? *Octorchis gegenbauri*, *Phialidium temporarium* and *Phialidium cymbaloideum*.

SIPHONOPHORA.

Muggiea atlantica, Cunningham.

This little siphonophore was abundant, especially the gonophores bearing ripe generative cells. It was scarce at Plymouth early in July, but abundant at the beginning of August.

Cupulita sarsii, Haeckel. sp.?

Only a few detached swimming bells and a fragment of a colony were taken. They probably belong to this species, which is often very abundant on the west coast of Ireland during the summer months. A solitary swimming bell was taken in the tow-net off Plymouth on July 4th.

CTENOPHORA.

Not a single Ctenophore was taken. Their absence is noteworthy, because *Pleurobrachia pileus* was fairly common at Plymouth about the beginning of July and a small specimen of *Bolina norvegica* was seen on June 30th.

ECHINODERMA.

Larval stages. Larval stages belonging to the Ophiurid group occurred in shoals. *Ophiothrix fragilis* was especially abundant.

A single specimen of *Bipinnaria asterigera* was taken.

Echinopluteus of *Echinocardium* was common.

POLYCHAETA.

Larval stages. A few very early stages of *Chaetopterus* were seen and a few fine trochospheres of *Polygordius*.

Tomopteris onisciformis. Early stages about 5 mm. in length were abundant. A few taken up to 10 mm. in length.

Autolytus. sp.? Few specimens.

CHAETOGNATHA

Sagitta bipunctata. Abundant.

CRUSTACEA.

The Copepods were not identified, but were plentiful enough in the net.

The larval stages of the Decapod Crustacea were abundant, especially the Zoae of *Porcellana* and *Cancer*.

A fine specimen of the larval stage known as Phyllosoma was taken.

Podon intermedius and *Eradne nordmanni*, both carrying embryos, were present in shoals, forming one of the characteristic features of the plankton.

PHORONIDEA.

Actinotrocha. A few specimens taken on July 22nd.

ENTEROPNEUSTA.

Balanoglossus. Tornaria larvae common. A nice series was obtained. To judge from the earliness of some of the stages, it is most probable that *Balanoglossus* lives between the islands.

TUNICATA.

Oikopleura flabellum Sp.? Very scarce.

CEPHALOCHORDA.

Amphioxus. Solitary specimens belonging to a late larval stage were taken on July 21st and 22nd.

THE SECOND VISIT, 27th April to 15th May, 1903.

On this visit I had the companionship of Mr. R. Vallentin. We made St. Mary's our headquarters, and confined our attention to the marine fauna of that island. We tow-netted from a small sailing-boat or a rowing-boat, but as the weather was in an unsettled state during the greater part of our visit, the days suitable for working outside were somewhat few in number.

As Hugh Town is situated on a narrow peninsula with the harbour on the north side and Porth Cressa bay on the south, we had the advantage of selecting the side most sheltered from the wind. But we found that the harbour and its adjacent water were not good places for tow-netting. The water is shallow and usually very dirty, being full of small fragments of *Zostera*, *Algæ*, etc. It was better to work outside Porth Cressa, for there the water is deeper, about 15-20 fathoms, and perfectly free from dirt. The plankton too was greater in quantity and superior in quality, owing to the excellent tide which runs off Peninnis Head.

The tow-nettings taken on our arrival clearly showed that the season was a late one. The medusæ, which usually occur about the end of March in the English Channel, were not taken until the beginning of May.

Two nets were generally used. One with a half millimetre mesh for the lower net, and the other smaller in size and of a finer mesh at the surface. The results given in Part I are based on the contents of the lower net, which had by far the best catch. The plankton found in the surface-net was identified by Mr. Vallentin and the results are given at the end of Part II.

HYDROMEDUSÆ. (*See also Table II.*)

ANTHOMEDUSÆ.

Amphinema. nov. sp.—This new species has been taken at Plymouth, and a description with figures is in preparation.

Dipurena halterata. All specimens belonged to the earliest stage.

Euphysa aurata. Young and intermediate stages.

Hybocodon prolifer, Agassiz. All the specimens had medusa-buds at the base of the tentacles.

Lar sabellarum. The few specimens taken all belonged to the earliest stage.

Margellium octopunctatum, Sars. A solitary specimen with medusa-buds.

Perigonimus. sp.? All just liberated from hydroids, and too young for the identification of the species.

Sarsia. sp.? This solitary specimen had not long been liberated, and was too young for identification.

LEPTOMEDUSÆ.

Clytia Johnstoni, (Alder). The specimens had just been liberated from the hydroid. *Phialidium temporarium* is probably the adult form. It is somewhat remarkable that on both visits the two commonest medusæ in the British seas, namely *Phialidium temporarium* and *Phialidium cymbaloideum* were not taken.

Euchilota pilosella. Either very early or intermediate stages. The largest about 15 mm. in diameter.

Euchilota. nov. sp. A good series from the earliest to the adult stage was taken. This medusa had been previously taken at Plymouth. A description of the species is in preparation.

Laodice calcarata. A very early stage with four tentacles was taken on May 9th. Umbrella $1\frac{1}{2}$ mm. in length. An intermediate stage, 12 mm. in diameter, was captured on May 12th.

Phialidium buskianum. Only early and intermediate stages.

Obelia. sp.? All were very minute and had not long been liberated.

The scarceness of the Medusæ is easily seen from Table II, and is due to the lateness of the season, for nearly all the specimens were either early or intermediate stages.

SIPHONOPHORA. (*Table I.*)

Cupulita sarsii. sp.? Not a single complete colony was taken, but many detached swimming bells and a few fragments.

CTENOPHORA.

Bolina norvegica, (Sars). sp.? A very early stage.

Beroë ovata, Eschscholtz. A very early stage, about 1 mm. in length.

POLYCHAETA.

Tomopteris onisciformis, Eschscholtz. A specimen about 15 mm. in length was taken on April 27th, and another on May 15th, and also an early stage, 2 mm. in length on May 12th.

CHÆTOGNATHA.

Sagitta bipunctata, Quoy et Gaimard. Nearly all were early stages, about 5 mm in length, a few only 3 mm. Large adults with gonads were scarce.

COPEPODA.

The Copepods were identified by Mr. Vallentin and his list is given in Table III.

LIST OF STATIONS.

27th April.—Inside St. Mary's harbour. Net at the surface. Nearly high water. Wind W., moderate. Cloudy. Sea calm, slight swell.

29th April.—Near the harbour buoy. About high water. Wind S.E., gentle. Cloudy. Slight swell.

30th April.—Outside the harbour. Tide half flood. Wind E., light. Raining. Sea calm.

4th May.—Off the mouth of the harbour. High water. Wind S.E., moderate. Dull. Sea calm. Surface temperature, 50°·6 F.

5th May.—Between St. Mary's and Samson. Tide half ebb. Net 3-5 fms. from surface. Wind W., very light. Sunshine. Sea dead calm. Surface temperature 51° F.

6th May.—Off Porth Cressa. Depth 10-15 fms. Tide three-quarter flood. Net 5-10 fms. from surface. Wind W., light. Sunshine. Sea lumpy, slight swell. Surface temperature, 51° F.

9th May. Off Porth Cressa. High water. Net 5 fms. from surface. Wind S.E., light. Sunshine. Slight swell. Surface temperature, 50°·6 F.

12th May.—Off Porth Cressa. Tide three-quarter flood. Net 5 fms. from surface. Wind N.E., gentle breeze. Sunshine. Sea calm. Surface temperature, 52° F.

15th May.—Off Porth Cressa. Tide three-quarter flood. Net 5 fms. from surface. Wind N.W., moderate. Sunshine. Slight swell.

Table I.—DISTRIBUTION OF CERTAIN PELAGIC ANIMALS,
CHIEFLY LARVAL STAGES.

1903.

	DATE.	APRIL.					MAY.				
		27	29	30	4	5	6	9	12	15	
<i>Balanus</i> (Nauplius)	VII	IV	III	III	III	III	II	I	II	
<i>Oikopleura flabellum</i> . (sp.?)	...	VI	VI	IV	IV	IV	IV	IV	III	III	
<i>Sagitta bifunctata</i>	2	1	III	II	III	IV	IV	V	V	
<i>Arachnactis bournei</i>	3	..	1	1	II	2	I	III	I	
<i>Antolytus</i> . (sp.?)	2	...	...	1	1	...	1	..	...
<i>Beroe ovata</i>	1	...	...	...	..	..	..	..	..
<i>Porcellana</i> (Zoea)	2	1	1	1	1	1	1	1	
<i>Pluteus</i>	1	1	1	1	1	1	1	1	
<i>Polychaeta</i> . (larval stages)	III	II	III	III	IV	III	III	III	
<i>Arcincola</i> . (larvæ)	2	5	II	III	III	IV	II	I	
<i>Tomopteris onisciformis</i>	1	...	...	...	..	1	1	
<i>Bolina norvegica</i>	1	...	...	...	..	..	..
<i>Cancer</i> . (Zoea)	VI	VI	V	IV	V	IV	
<i>Cupulita sarsii</i> . (sp.?)	1	1	1	1	1	
<i>Cyphonautes</i>	VI	V	III	...	
<i>Pilidium</i>	1	..	
<i>Phyllosoma</i>	1	..	

Table II.—DISTRIBUTION OF THE HYDROMEDUSÆ.

1903.

	DATE.	APRIL.					MAY.				
		27	29	30	4	5	6	9	12	15	
<i>Clytia Johnstoni</i>	III	1	1	II	II	..	...	...	...
<i>Obelia</i> , Sp. ?	1	...	1	II	1	2	2	3	III	
<i>Perigonimus</i> . Sp. ?	...	1	...	...	1	1	...	...	...	...
<i>Sarsia</i> . Sp. ?	1	...	...	...	...	...	...	...	...
<i>Lar sabellarum</i>	1	..	2	...	1	...	..
<i>Hybocodon prolifer</i>	1	1	2	2	2	1	2	
<i>Euchilota filosa</i>	3	...	...	3	3	III	
<i>Phialidium buskianum</i>	5	2	II	III	...	
<i>Laodice calcarata</i>	1	1	1	
<i>Euphysa aurata</i>	3	1	III	
<i>Margellium octofunctatum</i>	1	...	...
<i>Euchilota</i> . n. sp....	6	5	...	
<i>Dipurena hallerata</i>	1	2	III	
<i>Amphicema</i> . n. sp.	2	..	

I.—Very scarce. II.—Scarce. III.—Few. IV.—Fairly common.

V.—Common. VI.—Abundant., VII.—Very abundant.

The "Arabic" figures show the actual number taken.

Table III.—DISTRIBUTION OF THE COPEPODA.

By R. VALLENTIN.

1903.

	DATE.	APRIL.		MAY.				
		29	30	4	6	9	12	15
<i>Calanus finmarchicus</i>	B	B	A	B	B	C	C
<i>Clausia elongata</i>	C	C	C	C	C	C	C
<i>Dias longiremus</i>	A	B	C	B	B	B	B
<i>Euterpe gracilis</i>	A	A	A	...	...	...	A
<i>Oithona spinifrons</i>	A	A	A	A	A	B	A
<i>Microniscus calani</i>	1	...	..	...	..	...	...
<i>Centropages typicus</i>	1	1	...	5	...	3
<i>Anamalocera patersonii</i>	1	...	...	...
<i>Thalestris mysis</i>	1	1	...	...
<i>Caudacc pectinata</i>	2	...	6	12

A.—Few.

B.—Fairly numerous.

C.—Abundant.

The "Arabic" figures indicate actual numbers captured.

THE SHORE FAUNA.

By RUPERT VALLENTIN.

PART II.

INTRODUCTION.

The first serious attempt to study the fauna of this archipelago was made during the spring of 1850, a distinguished zoologist Dr. Victor Carus being sent by the authorities of the then newly established anatomical museum at Oxford to collect and dredge in those waters. A complete list of his captures will be found in "A Week in the Isles of Scilly," by the Rev. W. I. North, 1850. Since then, a few independent workers have visited these islands, and various fauna lists have from time to time been published in the journals and proceedings of the learned societies in Cornwall and elsewhere.

Like our predecessors, we were unable to find any absolutely land-locked spot where the fauna could find protection from the elements. Everywhere rounded granite boulders were scattered

broadcast along the foreshores ; and where the ground was at all soft, these stones were usually so deeply imbedded in the sand, that only about one in twenty could be turned over. Owing to the extreme hardness of this granite, there were no rock pools to be found within tidal limits. In the most sheltered coves sand-banks were present, and here the *Zostera* flourished, the tangled roots effectually binding the sand together. In Porth Cressa bay, by far the best collecting ground, there is an outer fringe of granite boulders which form a natural break-water, and in some measure protect the foreshores from the action of the waves. Here the littoral fauna is good, and a representative collection can be made especially during spring-tides. Possibly during the time of Lewes' visit in 1855 the season was more favourable, and many of the deeper-dwelling forms had come inshore for breeding purposes, and so he was able to record the capture of such rare nudibranchs as *Eolis alba* and *Acteon*.

I now pass on and give a list of animals found along the foreshores of St. Mary's island :—

ACTINIA.

- Anthea cereus*. Common between tidal marks.
Actinia mesembryanthemum. Abundant everywhere.
Sagartia bellis. Scarce, very locally distributed.
Halicylistus auricula. Two specimens low water spring-tide, Porth Cressa bay.

HYDROIDA.

- Campanularia neglecta*. On underside of a rock about low-water mark, Porth Cressa bay.

MOLLUSCA.

- Chiton*——— ? Capsules very abundant on sea-weeds.
Nassa reticulata. Common. Spawn abundant on *Zostera*.
Trochus cinerarius. Common.
T. ziziphinus. Scarce.
T. magus. Not common.
Patella vulgata. Abundant everywhere.
Scalaria communis. One specimen Porth Cressa bay.
Cardium edule. Common ; specimens very large indeed.

- Tapes pullastra.* Common.
Artemis exoleta. Several.
Littorina littoralis. Common.
L. rudis Common.
 NUDIBRANCHS.
Aeolis papillosa and spawn, once only.
Archidoris tuberculata and spawn, fairly abundant.
- CRUSTACEA.
- Cancer pagurus* Common everywhere, especially abundant in the harbour.
Pilumnus hirtellus. Abundant. Most of the females carrying ova.
Carcinus mænas. Common.
Portunus puber. Scarce.
P. arcuatus. Common. Many of the females carrying ova.
Porcellana platycheles. In swarms everywhere under stones, from half-tide down to low water. Most of the females with ova attached.
Galathea squamifera. Scarce.
Crangon vulgaris. Common.
C. fasciatus. Scarce.
Leander serratus. Common.
Macromysis flexuosa. Abundant.
Nebalia bipes Abundant in certain places. No parasitic rotifers belonging to the genus *Seizon* detected on any.
- VERMES.
- Spadella cephaloptera.* Very locally distributed Not very numerous. From a careful examination of these specimens there is no doubt that the species described by Lewes and named by him *Sagitta Mariana* is this species.
Arenicola marina. Common. Especially abundant at Porth Merlin beach,

<i>Sabella penicillus.</i>	One specimen.
<i>Spiorbis borealis.</i>	Common.
<i>Lanice concheligia.</i>	Four specimens.

ECHINODERMA.

<i>Asterias gibbosa.</i>	Very common.
<i>Asterias glacialis.</i>	Two seen.
<i>Comatula.</i>	One found in a tidal pool.
<i>Ophiura fragilis.</i>	Common.

SURFACE TOW-NET GATHERINGS.

Surface gathering, 29th April. Surface temperature of sea 50° F.

<i>Sagitta bipunctata.</i>	One specimen.
<i>Clausia elongata.</i>	Very numerous.
<i>Calanus finmarchicus.</i>	Abundant.
<i>Ectinosphæra diaphana.</i>	Scarce.
<i>Larvæ of Porcellana longicornis.</i>	Two stages present.
„ <i>Cancer pagurus.</i>	A few early stages.
„ <i>Balanus</i>	Abundant.
<i>Oikopleura flabellum.</i>	Scarce.

ALGA.

<i>Halosphæra viridis.</i>	A few specimens.
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Surface gathering, 4th May. Surface temperature of sea, 50·6° F.

<i>Clausia elongata.</i>	In vast numbers.
<i>Dias longirenus</i>	A few present.
<i>Oithonia spinifrons.</i>	Scarce.
<i>Calanus finmarchicus.</i>	Scarce.
<i>Balanus larvæ.</i>	Decreasing in numbers.
<i>Bolina. Early Stage.</i>	A few present.
<i>Obelia lucifera.</i>	A few present.
<i>Sagitta bipunctata.</i>	Scarce.

Larvæ of several species of decapod crustaceans including *Cancer pagurus* and *Porcellana longicornis*.

<i>Oikopleura flabellum.</i>	Increasing in numbers.
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<i>Atlanta</i> ———?	A few present.
<i>Arachnactis bournei</i> .	Four specimens present.

Surface tow-net gathering, 5th May. Surface temperature of sea, 51° F.

A few early stages of *Perigonimus*? Other forms as on the 4th.

ALGA.

<i>Halosphæra viridis</i> .	Increasing in numbers.
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Surface tow-net gathering, 6th May. Surface temperature of sea, 51° F.

<i>Calanus finmarchicus</i> .	Several.
<i>Clausia elongata</i> .	Very abundant, many females with ova attached.
<i>Dias longiremus</i> .	Scarce.
<i>Oithonia spinifrons</i> .	Not many.
<i>Plutei</i> .	Very scarce.
Two species of <i>Terebellid</i> larvæ fairly numerous.	
Several species of crustacean larvæ.	
<i>Sagitta bipunctata</i> .	3 large specimens.
<i>Cyphonautes</i>	Abundant.

9th May, surface tow-net gathering. Surface temperature, 50.6° F. All forms as on 6th. Small specimens of *Sagitta* fairly numerous.

12th May, surface tow-net gathering. Surface temperature, 52° F.

<i>Sagitta bipunctata</i> .	Numerous.
<i>Tomopteris</i> .	A few.
Various species of crustacean larvæ fairly numerous.	
<i>Clausia elongata</i> .	Very abundant.
<i>Oithonia spinifrons</i> .	Very few.
<i>Calanus finmarchicus</i> .	Scarce.
Remains of <i>Cupulita</i> .	

ST. PIRAN'S OLD CHURCH.

BY THURSTAN C. PETER.

So much has been from time to time written about this church that an excuse is perhaps required from anyone who ventures to refer to it again. In 1836 Mr. Trelawny-Collins published "Perranzabuloe, the lost church found," a very popular book at the time, but I should hope, now forgotten. It is a kind of anti-popery lecture, in which the dying words of St. Piran himself are reported as history without the slightest intimation that the author composed them himself. St. Piran's prophecy of the troubles that the papacy would cause when he was dead are very edifying. As a contribution to archæology the book neither is, nor was intended to be, of any value.

The Rev. Mr. Haslam published articles on the subject in various magazines, &c., but we must confine our attention to two only of his books.

In the "West Briton" of 24th January, 1895, was a long and very interesting article on the subject by Mr. J. V. Sigvald Muller, of Newquay, in which, from papers and plans in his possession, he showed that Mr. Haslam's little book, "Perranzabuloe, with an account of the past and present state of the oratory of St. Piran in the Sands," first published in 1844,¹ and his later work, "From Death unto Life," contained statements which were absolutely irreconcilable with the real facts of the case. But, probably, few people filed the "West Briton"—certainly but few people remember Mr. Muller's able and temperate exposure. In 1897 Prebendary Hingeston-Randolph published the 2nd volume of his edition of the Register of John de Grandisson, bishop of Exeter. On p. 607 is a record of the visitation of this church in 1331 by the commissary of the dean and chapter of Exeter, which, translated, reads as follows:—"Piran. There is here a sufficiently good chalice. Six pairs of corporals with repositories, some being worn. Three worn surplices. There is no nuptial veil. The

1. We regret to say, at the request of this Institution, to whose members Mr. Haslam had read a paper on the subject.

pall for the dead is worn. The missal is imperfect and wants binding. The tropar is rubbed and badly bound. Two temporalia and two sanctoralia, whereof one temporale is badly bound, and without boards. An imperfect antiphonary. A worn ordinal. An imperfect capitular and a book of collects. An ivory pyx without a lock. A chrismatory without a lock. A pax-board without a painting [*i.e.*, of the crucifixion.] A poor paschal candelabrum. No lantern or bueta [doubtless the same as botta, the lamp carried before the priest when he conveyed the eucharist to the dying.] No small bells for the sick. A font without a lock. No choral cope or reliquary (*filaterium*.) The glass is missing in the windows of the nave. The parishioners of St. Piran are bound to repair the chancel and to provide the books for matins, and have hitherto received a tenth of the store of the said church, and have discharged their obligation in this respect. Now, however, it is said that through their carelessness the store is mostly wasted. . . . The parishioners continue as before to carry the relics of St. Piran in an unwarrantable manner to various and even distant places."

To this record, which refers of course to a later edifice (probably on the site of what is generally spoken of as "the second church," and which was partly removed in 1805 to its present position inland),² Mr. Hingeston-Randolph adds a long and interesting note drawn from the same sources as Mr. Muller's letter. But these editions of the episcopal registers are naturally not volumes where everyone would look for information of this character. I think there should be a record of the truth about the old church in our journal, and that it should take the form of a print of Mr. Michell's notes, illustrated with a copy of his ground plan.

2. Or, possibly, the ruin to which this paper refers was merely a chapel, perhaps that referred to in the Taxation of the Vicarage, 13th August, 1269, when there was assigned to the vicar the whole altalage of "the mother church and the chapel." The present parish church was dedicated 18th July, 1805. The "second" church continued to be used for burials long after it had been partially destroyed. The last burials there, as far as I have been able to ascertain, were those of Mrs. Ruddiman, d. of Edward Jenkin, a Barnstaple gentleman, who had settled at Reen, who was buried in 1830, and of her brother, James Jenkin, who was buried there in 1835. Mr. E. Jenkin married a Miss Cottie, one of the family formerly owning lands at Perran, now the property of the Enys family. A tablet to members of the Cottie family is believed to be still on the buried portion of the walls. The so-called "second" church must have succeeded at least another, its date being of the 15th century.

Plate 7.



HEADS FROM DOORWAY, ST. PIRAN'S ORATORY.

By the courtesy of Mr. Muller, I have here the original account given by Mr. Wm. Michell, of Comprigney, of his excavation of the church in 1835. He did not discover the church; that had been done many years before. It is stated that an old man called Jenkin observed the tops of its walls very early in the last century; in 1817, when Gilbert wrote his "Survey of Cornwall," the two end walls were partly visible, and on the south side was observable the burial ground, full then (as it still is) of human bones. But Mr. Michell was the first who excavated the church. The following is a complete copy of his notes, except the introductory portion as to the history of the saint, which, as of no value, I omit. I have not attempted to correct, or even to interfere with the peculiar phraseology of the original. Notes within [] are not Mr. Michell's:—

"DESCRIPTION OF ST. PIRAN'S CHURCH, &c., &c.

The coast of Saint Piran has been regarded from the earliest times as the most dangerous to mariners of all the coasts of Cornwall.

As a proof of this assertion, the numerous hillocks raised as mementos to the human bodies deposited underneath them may be brought forward in full confirmation. Even where the author now resides (Ponsmere Cottage) human bones³ innumerable have been discovered, owing their premature interment equally as well to the tremendously high cliffs as to the violent storms by which they were assailed, and which rendered their escape impossible. In one of those storms of unexampled violence and unprecedented duration, tradition reports that the most fertile parts of St. Piran were destroyed by the sands of an island situated at a short distance from its shores being broken up and thrown over them.⁴ The venerable church of the Saint, its founder, shared a similar fate, and remained covered therewith until the month of September, 1835.

Many previous attempts had been made to remove those sands, but all proved unsuccessful, in consequence of water impeding them. The author imagining that he had little, if any-

3. [Mr. Michell has erased "bones" and written over it "bodies".]

4. This tradition is supported by the fact of every species of the shells common to this coast being to be found in the bosom of the Sand Hills covering it.

thing, to apprehend on this score (as a mine had been set to work in its vicinity) determined to make a fresh attempt, and, happily, he has succeeded. He now lays before his reader the results of his operations and researches, and accompanies them with various notes from ancient drawings of the building⁵ and in its dilapidated state; of its doorway, niche, and window (if such it may be designated), and also with a view of the church restored, and the churchyard and scenery around it.⁶

DESCRIPTION OF THE CHURCH.

The church, which is built nearly east and west, inclining only 4° north of west, is but of small dimensions, the length without the walls being 30 feet, and within the walls, 25 feet; the breadth within, 13 feet in the chancel, and 12 feet in the nave, and the height about 13 feet; but as there were several chapels or oratories in its vicinity, viz.: one on the Chapel Rock in Perranporth, now partially surrounded by the sea, another at Perranwell, and a third at Lambourne very near this well, in all of which, Saint Piran, the venerable Bishop and Founder, is said to have performed divine service; it was, no doubt, sufficiently large for the population of the immediate neighbourhood. There is a very neat Saxon⁷ arched door-way, 7 feet 1 inch,⁸ by 2 feet 4 inch. in a good state of preservation, ornamented with pretty tracery, the arch itself having on its key stone the head of a Tyger, and [at] the points of its curve⁹ the head of a man and that of a woman rudely sculptured of stone most assuredly of very remote antiquity,¹⁰ in the centre of the nave in the south wall, and another door-way in the north east corner near the altar of similar dimensions and style (with the exception of the

5. [An illegible word].

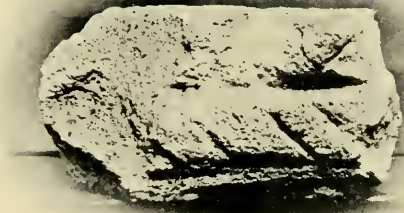
6. [These drawings are missing].

7. [Mr. Michell, no doubt, used the word "Saxon," as many others did in his day, without apparently any very exact meaning].

8. [By a clerical error Mr. Hingeston-Randolph has given this as 7 feet 4 inches. The MS. is quite clear. There are other differences between his copy and mine arising from his having corrected the author's phraseology, whereas I have preferred to print it as it stands].

9. [The word 'curve' is underlined, and in the margin Mr. Michell has written "qu"'].

10. [At the foot of the page on which this occurs, the author has written " N.B., date the work—the day when I removed the sand from it." These heads are now in our Museum, as also a piece of the jamb, and are here illustrated].



MOULDING OF DOORWAY, ST. PIRAN'S ORATORY.

heads), if one may judge from the remains of its arch lying near it; and which may be assumed to be that intended for the priest himself, leading into the chancel.

The chancel is exactly $9\frac{1}{2}$ feet long, and shows in its north and south walls the precise spots where the railing separating it from the nave was fixed. Attached to the eastern wall of the chancel is an altar nearly equidistant between the north and south walls, 5 feet 3 inches long, by 2 feet 3 inches wide, and 4 feet high, built of stone and neatly plastered with lime: 8 inches above this altar is a recess or niche about 12 inches high, by 8 inches wide, in which, undoubtedly, was once Saint Piran's shrine, so much frequented for many ages by thousands of devout, but mistaken, pilgrims who flocked from every quarter to present their offerings to the departed Saint.

As there is only one small aperture or window 12 inches high by 10 inches wide, about 10 feet above the floor in the south wall of the chancel, we may almost take it for granted that the service must have been carried on chiefly, if not altogether, by the light of tapers.

A stone seat raised 14 inches above the level of the floor, and 12 inches wide, covered with lime plast[er] runs all round the walls except the east and south walls of the chancel.

The nave is exactly $15\frac{1}{2}$ feet long, its floor, together with the floor of the chancel, being composed of lime and sand apparently as perfect as when first laid down. Each door has two low steps to descend into the church, and the church itself is plastered with beautifully white lime. The masonry of the entire building is of the rudest kind, and is evidently of very remote ages; there is not the slightest attempt at regular courses, but the stones, consisting of granite, quartz, sand stone and porphyry, &c., appear to have been thrown together almost at random horizontally, perpendicularly, and at every angle of inclination just as the hand, not the eye of the workman happened to direct him. To render the church as perfect as when it was originally erected, nothing seemed wanting but its doors and roof, and not an atom of wood, except a piece of about 8 inches long by 2 inches wide, and 1 inch thick, was found within or without the walls. That there were many bodies interred, both in the chancel and the

nave of the church, is an unquestionable fact. Several skeletons have been found deposited about 2 feet below the floors. Three were discovered with their feet lying underneath the altar—one of them of gigantic dimensions, measuring about 7 feet 6 inches, and then¹¹ three placed beside each other without their heads: their heads (which appeared to be almost cemented together) lay between the knees of the skeleton deposited nearest to the south wall, in all probability those were the remains of martyrs who had suffered for the faith Saint Piran preached.

On the southern and western sides of this venerable ruin is the ancient burial ground, strewed over with tens of thousands of human bones and teeth as white as snow, and, strange as it may seem, the showers of sand which fall all around, hardly ever remain on those melancholy relics of mortality. The skeletons hitherto discovered are all laid east and west, with the legs frequently crossed like those of the Knights Templars. Nothing in the church in the shape of inscription or coin was found by which any ray of light could be cast on its antiquity.

The mode of interment in this burial ground was probably such as was generally adopted in the early ages. The bodies appear to have been laid in the sands uninclosed in wood,¹² but probably covered with linen or flannel, in graves a few feet below the surface; flat stones are usually found underneath the skeletons, and similar stones placed around and over them [their chests] with other thicker [stones placed]¹³ at the head and feet.

About fifty years ago in this burial ground were found a very curious and massive silver ring and a Roman coin.¹⁴ The ring is in my possession, and shows a neatness of ornament which might well be attributed to Roman manufacture, and which would do no discredit to the taste of the present day. This ring was, undoubtedly, deposited in the sand with its wearer.

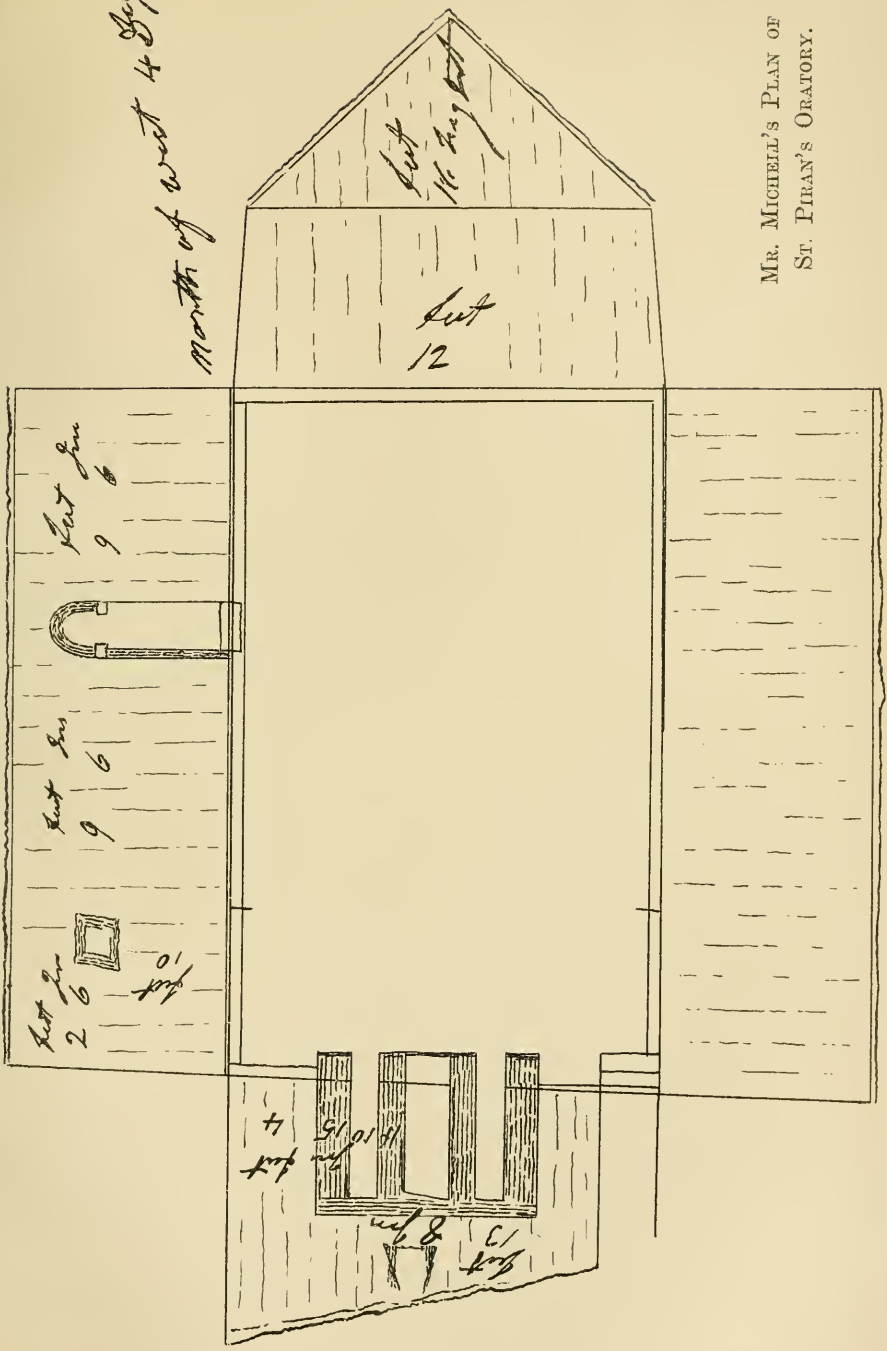
11. [Or "these." The writing is not clear].

12. [Above these words there is interlined in pencil, "not in wood" in, I think, Mr. Michell's handwriting. Here, as elsewhere in the MS., he seems to have attempted to revise the wording].

13. [The words in brackets are added in pencil by Mr. Michell, apparently with the view suggested in note 12 above].

14. [Here the words, 'of the Lower Empire,' have been struck through].

month of west 4 days



MR. MICHELL'S PLAN OF ST. PIRAN'S ORATORY.

PRIEST'S HOUSE.

This building, which was also buried in the sands, is distant from the church little more than 100 yards. At the time when the church was overwhelmed, probably it experienced the same fate. The dimensions are very contracted, not exceeding 16 feet¹⁵ long, by 12 feet wide, and 10 feet high. Whether it had a chamber or chambers is extremely uncertain, as some large pieces of wood were discovered in the excavation. One window only could be found, and that in the south front near the eastern gable.¹⁶

The door, about 7 feet high, by 2 [feet] 2 inches, was in the centre of this front, and the wood of its case and threshold was completely rotten.

At a short distance from the house were discovered considerable quantities of sea shells with the fragments of an earthen pot."

On the outside of the MS. is a pencil memo. by Mr. Michell of the results of apparently a subsequent visit.

"OLD CHURCH, ST. PIRAN.

Width of the eastern end.

Within 13 feet including door on north end of the altar 2.6; western end, 12 feet.

Altar—front, 3.6., in all 5.3.

Sides within inside of the front, 10½ inch.

Depth, 2.3 in.¹⁷ 1.9¹⁸

Distance from south wall 4 feet.

from No. wall 3.9 feet.

From top of the altar to the bottom of the niche, 8 inches.

Height below the beams 12 feet.

below the eaves of the roof 16 feet.

15. [Mr. Hingeston-Randolph prints "15 feet," but the MS. is clear].

16. [Here is an asterisk suggesting that one of Mr. Michell's addenda should be inserted, but none such is with the papers. Haslam's copy (Perranzabuloe, p. 77) is slightly different, and contains this.—"The door had been removed; but its wooden doorcase and threshold remained in their place, although in a very decayed state"].

17. [See p. above and the plan. The pencil writing is very faint, and this figure 3 has apparently been altered].

18. [i.e. twice 10½ inches.]

Benches, 14 in. in high, by 12 in. wide on 3 sides.

Chancel, $9\frac{1}{2}$ feet wide.

Nave $15\frac{1}{2}$ "

[Here an asterisk reference to a following page, on which is written, "Chancel, $9\frac{1}{2}$ feet."]

Correctly ascertained the north and south walls, and plainly evidently⁽¹⁹⁾ showing the precise points where wood work had been fixed for the purpose of separating it from the nave."

The memo. proceeds—

"SOUTH DOOR.

Saxon arch, ornamented in the centre with a Tiger's head, and at the right base of the arch with a woman's head, and left with a man's head rather rudely carved.

Fixed in the right groove of the doorway and part of the door-hinges, and in the left hollow space in which a bar in which might have been inserted for the purpose of fastening the door.⁽²⁰⁾ All the doorway was built of a soft granite or sand and cut into blocks of 8 to 10 square, and ornamented with tracery in two compartments."

Mr. Muller has also handed me the original sketch by Mr. Michell, and it is here reproduced. It will be observed that the measurements of the altar are at first sight quite impossible—the whole being marked as 5 feet 3 inches; but the sum of the items of less than one half, viz.: $15'' \times 10'' \times 11'' = 3$ feet.

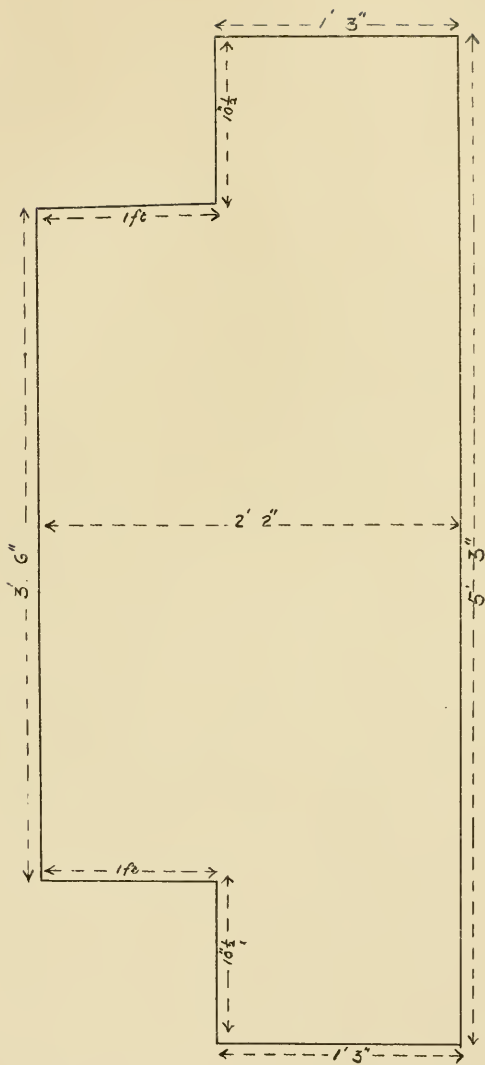
The drawing, too, is rude, but Mr. Michell was, though not an artist, yet a competent engineer accustomed to observation and measurements, and the discrepancy probably arises from our misunderstanding his rough figure memoranda. Mr. Muller suggests to me, and it is highly probable (especially having regard to Mr. Michell's memo. that some of these measurements refer to the "sides within inside of the front") that the figures on the plan are meant to indicate an altar of this shape

If so, this confirms the information given to Mr. Muller and others by some who had seen the original altar, that these corners were cut out, leaving spaces which it has been suggested were probably for the front supports of a baldachin. Another

19. [Sic.]

20. [The sense of this is not very clear. The MS. is full of erasures.]

Plate 10.



PROBABLE SHAPE OF ALTAR, ST. PIRAN'S ORATORY, FROM MR. MICHELL'S MEASUREMENTS.



strong argument in support of Mr. Muller's suggestion is, that this does away with the four supports shown as in line in the drawing, a very unnecessary number for so short an erection. Moreover, the altar being of masonry, would not need any such supports at all. Mr. Haslam (who arrived in the county in 1842, seven years, that is, after the excavation) had also heard of these cut-out corners and reproduced them at the end of the ridiculous slab which he erected, and which, with its foolish inscription, "S. Piranus," in fancy lettering, still disfigures this interesting ruin, and misleads the unwary visitor. The public must choose for themselves between the account given by the original excavator in this document, preserved in his family until the death of the late Col. W. E. Michell in 1892, and then given by that gentleman's widow to Mr. Muller, and the stone erected by a gentleman who, without any warrant, perpetrated the eccentricity of an altar running east and west, and in his published work (Perranzabuloe, p. 75) justified it as a proper position for an altar that was also a tomb!

He also tells us (p. 74) that "attached to the east wall was an altar, built of stone and plastered like the rest of the interior. In 1835 it was taken down, and St. Piran's headless remains were discovered immediately beneath it. It has since been carefully rebuilt with the same stones; a solid block of granite, cut to the exact peculiar shape and dimensions of the original altar, has been placed over it."

In that extraordinary book, "From Death unto Life," first published, I believe, in 1880, Mr. Haslam (p. 20 of 1897 edition), after claiming to have been the discoverer of the buried church, which had been cleared by Mr. Michell seven years before Haslam came into Cornwall, proceeds: "The legend said that the patron Saint, St. Piran, was buried under the altar, and that close by the little church was a cell in which he lived and died. This was enough. I got men and set to work to dig it up. After some days labour we came to the floor, where we discovered the stone seats, and on the plaster on the wall the greasy marks of the heads and shoulders of persons who had sat there many centuries ago. We found the chancel step and also the altar tomb (which was built east and west, not north and south.) *It was fallen, but*

enough remained to show the original shape and height of it."²¹ This and the further legends cited by Mr. Haslam probably dated from 1835, and had become distorted in those few years. He also gives us a drawing of the church as it appeared in 1845 which does not even accord with his own description.

From the Episcopal Registers we learn that in 1269 the vicar's stipend was partly made up of the profits arising from carrying round the saint's relics; in 1331, as already mentioned, they were accused of the irregularity of carrying them too often and too far, and in 1281, in an inventory taken at St. Piran's of the goods of the church, there are enumerated (amongst many other things) a box in which St. Piran's head was kept, and a hearse in which is placed the body of St. Piran (*i.e.*, for processions.)²²

By his will, dated 18th April, 1433, Sir John Arundel, knight, bequeaths 40/- for the use of the parish to enable them to enclose the saint's head honorably and in the best manner they could devise.

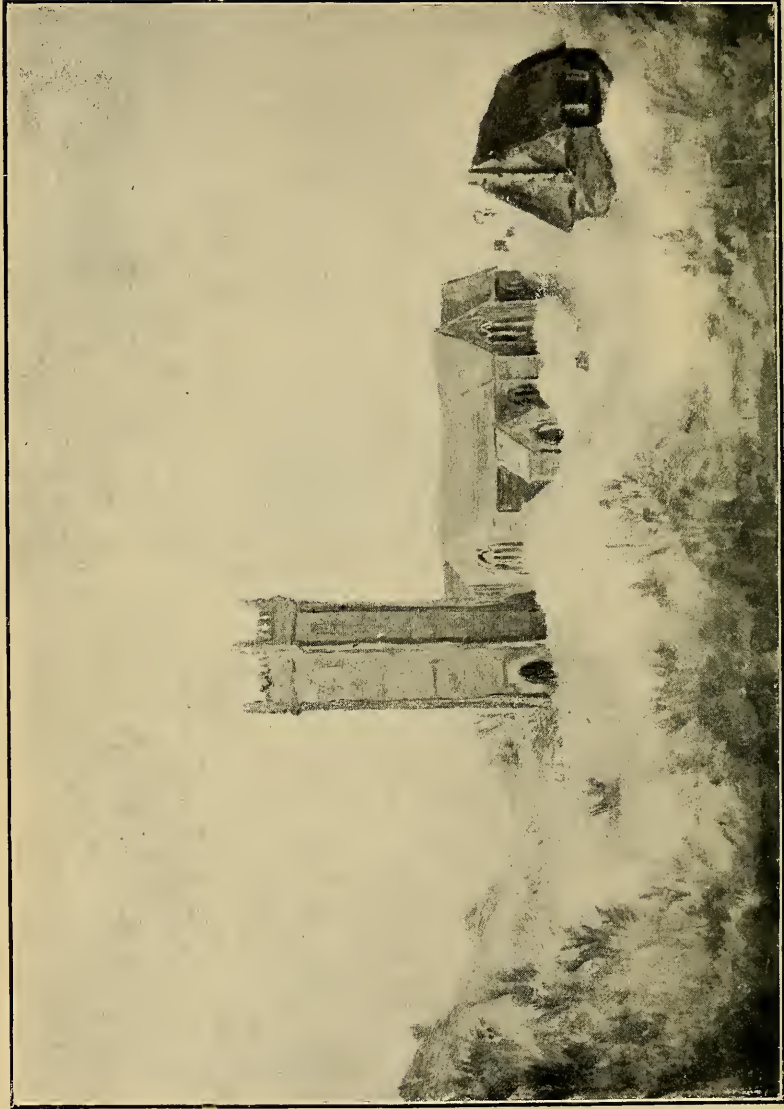
Even a saint could hardly be dug up every time there was to be a procession of relics through the parish. Mr. Michell discovered a niche suitable for keeping such relics behind the altar; Mr. Haslam converted this into a window.

Numerous other instances are there of what we will call "mistakes" on the part of Mr. Haslam. His whole account seems to be the product of an hysterical and vain man, unable to weigh evidence, and unaccustomed to be exact: he may probably be acquitted of any intentional misstatement.

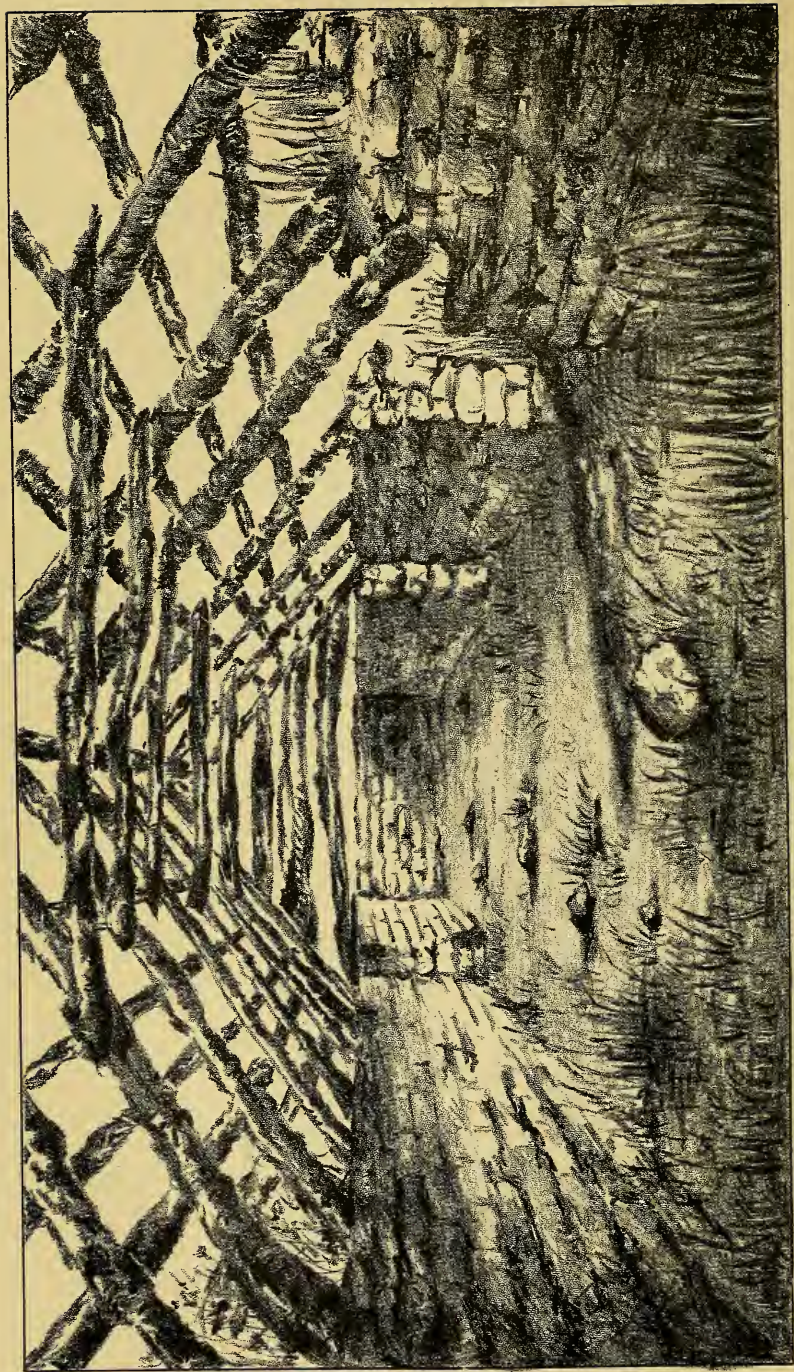
It might not be worth while noticing them were it not that the book, "From Death unto Life," had, and still has, a phenomenal circulation amongst the uncritical public, and that its statements on St. Piran are firmly believed by hundreds of people to-day, while the notes of Mr. Michell are forgotten, and the crushing exposure in the pages of the "West Briton" in 1895 by Mr. Muller is by many forgotten too. Mr. Muller has known the ruins and studied their history for more than 30 years, his profession entitles his lightest opinion to respect, and his possession of Mr. Michell's original record makes him, undoubtedly, the best authority we have on this old building.

21. The italics are mine.

22. See Oliver, Mon. Dio. Exon., Addl. Supp., p. 10.



ST. PIRAN'S SECOND CHURCH, FROM WATER COLOUR SKETCH IN POSSESSION OF
MR. HANCOCK, OF ST. AGNES.



GWITHIAN ORATORY — INTERIOR.
From a sketch by Rev^d E. Evans, 1861.

We give, for purpose of comparison, and because it is desirable that it should be preserved, a reproduction of a sketch of St. Gothian's oratory, in the parish of Gwithian, made by the Rev. E. Evans in the year 1861, and kindly supplied by the late Rev. Canon Hockin of Phillack. Blight²³ gives a plan of this building as also a sketch of the doorway. He does not state whence he derived this sketch, and at the time he wrote the walls were buried, but there is no reason to doubt its correctness. The building measures, within, 48 ft. 11 in., of which the chancel claims 17 ft. 1 in. and the nave 31 ft. 10 in. The width of the chancel is uniformly 11 ft. 10 in.,²⁴ of the nave at its eastern end 14 ft. 4 in., and at its western end 13 ft. 10 in. The doorway is in the south wall about 9 feet west of the chancel. The general arrangement of the building was much the same as at St. Piran's, with a masonry altar at the east end, apparently a priest's doorway just north of it, and stone benches along the north and south walls of the chancel; but the length is greater in proportion to the width, and we have been told by those who saw it when uncovered that the masonry of the chancel walls was far less rude than that of the rest of the building, and was evidently an addition.²⁵ The general impression was that the building, other than the chancel, was older even than St. Piran's. At the time when the sketch was made by Mr. Evans the building was in use as a cattle shed, and unfortunately the farmer destroyed the altar, not knowing its value.

NOTE.—Since the above was written an interesting service has been held (18 Aug., 1904) on the site of St. Piran's Church, by the fine cross. About 1,500 persons were present and heard the admirable address by the Bishop of Truro. The festival, which was in celebration of the centenary of the removal of the church to its present inland position, was continued in the parish church on the following Sunday. (*Church Times*, 26 Aug., 1904).

23. "Churches of West Cornwall," 2nd edition (Oxford, 1885), p. 137.

24. Blight gives 12 ft. 2 in. as the width of the chancel. If the measurement was made while the building was uncovered, his measurement is probably more correct than that in the text as the few stones now showing may have been displaced.

25. The regularity of the stone courses in the wall as shown by Mr. Evans is clearly an error on his part; but the general correctness of his sketch is confirmed by Blight's plan.

A CATALOGUE OF SAINTS CONNECTED WITH CORNWALL,
WITH AN EPITOME OF THEIR LIVES, AND LIST OF
CHURCHES AND CHAPELS DEDICATED TO THEM.

By The Rev. S. BARING-GOULD, M.A.

PART VI. *Ma—Non.*

S. MAWNAN, Bishop Confessor.

The saint has given his name to a parish in Cornwall. In Bishop Quivil's Register(1281) he is called Sanctus Mannanus.¹ In that of Bishop Grandisson, 1323, Robert Flammanke is called Rector of S. Mannany, but in the same year, in another document Rector Sanct' Mannani; so also 1347, 1348, 1350, 1361; also in the Taxation Pope Nicholas IV, in the Registers of Bishop Brantyngham, 1381 and 1391, and in that of Bishop Stafford, 1398.

Mawnan is the softened Brythonic form of the Goidelic Maignenn. The feast of S. Maignenn of Kilmainham is observed on December 18th, and that of St. Mawnan on December 26th. At the rededication of the church in the 15th century, it was given a second patron, according to the practice of the Bishops of Exeter, who endeavoured by this means to displace the old Celtic saints. The new patron was S. Stephen, and the Feast was then doubtless transferred to his day, which, coming immediately after Christmas, was near enough to the old feast not to wound the susceptibilities of the Mawnan people, and it obviated the unsuitability of keeping the Patronal Feast during Advent.

Mawnan is in the district colonised by the Irish; and although we do not know S. Maignenn or Maignenn was in Cornwall, yet it is by no means improbable that he did visit it, and had there a branch establishment, as he was a great traveller. Maignenn was one of four brothers, sons of Aedh, and was an intimate friend of S. Findchu of Kilgoban, S. Loman of Lough Owel, and of S. Finnian of Moville.

1. Or *Mannanus*.—Edd.

He was ordained bishop, and when at home was at Kilmainham, but he was of a restless disposition, and was incessantly on the move, accompanied by twenty-seven clerics, a peripatetic school, like that of the bards.

He visited Diarmid, son of Fergus, King of Ireland (544-565) and preached vigorously before him on the terrors of hell, and so frightened many of his hearers that thirty of the Court abandoned the world and became monks. The king moreover was so panic-struck that to make his peace with God and the Saint, he granted him "a scruple on every nose, and an ounce of gold for every chieftain's daughter, on her marriage."

Maignenn had a favourite ram that attended him on his missionary tours, and the Saint was wont to fasten his book of prayers round the neck of the beast, and make it carry the volume for him. One day a thief stole and killed the ram. Maignenn found out who was the culprit and went to his house, where he cursed him that his eyes should go blind, and his belly swell till he burst. The man was so terrified that he admitted that he had killed and partly eaten the pet ram, and offered to do penance.

S. Maignenn paid a visit to S. Molaiss of Leighlin, who was wont, like an Indian fakir, to lie on the ground with his arms and legs extended, upon his face, and to howl. He was covered with thirty sores, and was enclosed in a narrow hovel.

Maignenn asked him why he lived such a horrible life, and Molaiss replied that—"his sinfulness like a flame pervaded his body," and he lived in this manner to extirpate his sins. Maignenn enjoyed the privilege of solemnly burying the fellow.

He also paid a visit to an equally nasty saint, Findchu of Kilgoban. "It was this Findchu who oftentimes occupied a stone cell somewhat higher than his own stature, with a stone overhead and one under foot, and two iron crooks, one on each side of the cell; on those he was wont to place his armpits, so that neither did his head touch the stone above, nor his feet the flag beneath. He was wont also to lie for the first night in the grave with every corpse that was buried in the churchyard."

Maignenn seems to have relished visiting these monsters of asceticism. Another whom he favoured was Maelruan, whom he found in a well, up to his chin in water, lustily chanting the

entire psalter. When Maelruan got out, he took a brooch from his hairy habit, and smote himself on the breast with it, and then invited his visitor to observe that from the wound made by the pin of the brooch, a liquid exuded that was pale in colour and not red like wholesome blood, "and that," said Maelruan, "is token that there remains very little pride in me." Maignenn was so impressed, that he begged the Saint to hear his confession. Maelruan hesitated "Do you exercise yourself in any manual labour?" he asked. Maignenn was forced to confess that he did not. His time was occupied in saying his Offices, and in wandering about the country. Maelruan then bluntly told him he could not and would not minister reconciliation to a man who did not work for his daily bread, but lived on alms.

The visitor then humbly entreated the ascetic to give him at least some spiritual advice. This Maelruan did in these words:—"Weep for the sins of your friends and neighbours, as though they were your own. Set your affections on God and things above, and not on persons and things below. Meditate on Mary, Mother of Glory, on the Twelve major prophets, on John the Baptist and the minor Prophets, together with Habacuc. Think on the four Gospels, the Twelve Apostles, and the Eleven Disciples, on the band of youths that attend on the King Eternal, the token of their service being a cross of gold on their foreheads, and a silver cross on their backs. Meditate on the nine Angelic Orders, and on the blessing of the Heavenly City." Maelruan then promised Maignenn that his fire should be as celebrated at Kilmainham as were the two other famous fires in Ireland, that is to say those kept perpetually burning at Kildare.

Maignenn seems to have been disposed to imitate these austerities, and he allowed his body to become a prey to vermin. But one day he met S. Furse, and the two saints began to talk of their mutual discomforts. Furse said that he was much bothered with dysentery. "If you will take my vermin, I will take your dysentery, and so exchange troubles," said Maignenn, and we are gravely assured that the saints did thus pass over their afflictions to one another.²

2. Vita S. Cuannatheí, cod. Sal., col. 936.

On one occasion when wandering over the bogs and hills, S. Maignenn lost his way; night and rain came on, and no house was in sight. So he planted his staff in the earth, and he and his disciples attached their cloaks to it, and spread them out, and all huddled underneath this extemporised tent, and spent in it a most miserable night.

He, like most other Irish saints, maintained a leper. His leper was a woman, and for her support he gave her a cow. A robber stole the cow. Thereupon Maignenn and his clergy excommunicated the thief with bell and book. Maignenn so soundly cursed the man, that some of his clergy interposed, and entreated the Saint to at least allow the wretch a nook in heaven, however much he might afflict him with cramps and pains on earth. But Maignenn was inexorable, "Rather," said he, "so great is my indignation, that I seek to rouse God's anger to increase the everlasting torment of the man hereafter." Then he burst forth into maledictions against such as should violate his privileges of sanctuary. "I curse them that they may lose the sight of their eyes, that they may die violent deaths, and that the gates of the Heavenly City may be shut in their faces."

Maignenn is also credited with having uttered a prophecy, which it is the conviction of many has been fulfilled. "A time will come when girls shall be pert or tart of tongue; when there will be grumbling and discontent among the lower classes, when there will be lack of revenues to elders, when churches will be slackly attended, and when woman shall exercise wiles."

Maignenn is said to have studiously shunned the society and favours of kings, and to have interposed when he heard of war breaking out. He had a faculty of discerning the spirit of man, after he had been three hours in his company, and deciding whether he was a sincerely good man or a hypocrite.

He could give good advice. One day he said:—"Of all the absurd things I ever saw was an old fellow haranguing his sons on virtue, when the rogue himself had never exercised the least self-restraint." He was himself unmarried, and was strongly opposed to clerical marriage, and said some hard things, and even extravagant things thereon. Being such a rambler himself, he was able to give good advice relative to pilgrimages. He

declared that the wish to visit a holy spot sufficed, if so be that he who desired to undertake the journey was detained by domestic duties. He strongly condemned those who proposed to themselves pilgrimages with the object of shaking off religious responsibilities and moral discipline such as they had exercised, but found irksome at home.

It is quite possible that some of the extravagancies attributed to Maignenn are due to the invention of the biographer of Kilmainham, who imagined the curses so as to deter the violent from laying hands on the property of the monastery. So many of his sayings exhibit sound sense and real piety, that we are inclined to doubt the genuineness of such as breathe a different spirit.

The authority for the brief notice here given is an Irish Life published in the "*Silva Gadelica*;" that is unquestionably incomplete, consequently we do not know the particulars concerning the close of his life, nor can we fix with any confidence the date of his death.

Maignenn was a friend of S. Fursey before the latter left Ireland, which was in the reign of Sigebert of the East Saxons, in or about 637. He was also a friend of S. Findehu who was a contemporary of Cairbre Crom king of Munster, who died in 571; but Findehu was certainly older than Maignenn. The Maelruan he visited was not Maelruan of Tallaght, who died in 732, but Maelruan of Druim Ruithe in West Meath, who lived earlier. He is also spoken of as visiting Diarmid, King of all Ireland (544-565), so that probably Maignenn lived in the latter part of the 6th century, and died about 648. The story of his taking dysentery after a visit to S. Fursey may mean that he was prostrated after that visit, and died of it.

The only dedication to Maignenn in Cornwall is S. Mawnan. It lies at the mouth of the Helford river, close to the sea, over against S. Anthony. The church is mainly Perpendicular, and has the remains of a fine screen with painted figures of saints on it.

There was a Sanctuary attached to Mawnan Church, called "The Lawn," or Llan. At the extremity of the point is a rock called Mawnan's Chair.

The Church stands in a circular enclosure, probably the original bank of the monastery of S. Mawnan, and in "The Lawn" is the Holy Well.

S. NECTAN, Bishop, Martyr.

A reputed son of Brychan, according to the lists given by William of Worcester and Leland. His great foundation was at Hartland, but he had other churches at Welcombe, where is his Holy Well, at Poundstock, where he has been displaced to make room for S. Neot, at Ashcombe in Devon. He had a chapel at Trethevy in Tintagel, and another at S. Winnow, which has been restored and is in use.

Anciently, there must have been one at Launceston, for a Nectan fair is there held on his day.

The account of the martyrdom of S. Nectan is in an extract from his Legend at Hartland, made by William of Worcester. He was fallen upon by robbers at Nova Villa, *i.e.* New Stoke, where now stands the church, and his head was struck off. After which he took up his head and carried it for the space of a stadium—about 625 feet, to the spring near which he had dwelt in his cabin, and there he placed it on a stone which long afterwards remained dyed with his blood.

Nectan, as has already been pointed out, is not a Welsh name, nor even, originally an Irish name, but is Pictish. Nectan does not occur among the sons of Brychan given by the Welsh authorities

William of Worcester says that his day is June 17. This is also Nectan's day in the Exeter Calendar, in the Altemps Martyrology of the 13th century, and in a Norwich Calendar of the 15th century. Curiously enough, the Irish Martyrologies give "the sons of Nectan" on the same day.

Wilson, in his Martyrology, 1640, gives February 14, and for this he must have had some authority, as on this day a fair is held at Bridgend in S. Winnow, where is a chapel to S. Nectan.

The feast at Hartland and at S. Winnow is on June 17.

S. Nectan's Well is at Stoke near Hartland Church.

A curious tradition exists at S. Winnow, that S. Nectan lived at Coomb, a ruined farmhouse near S. Nectan's, or as there called S. Neighton's Chapel, and that he was martyred at Tollgate, some little distance off.

According to Nicolas Roscarrock, there was formerly a chapel of S. Nectan with a graveyard in Newlyn parish, "and four stones on a mount or hill at North-west corner, where the crosses and reliques of S. Peran, S. Crantock, S. Cuthbert and S. Newlan were wont to be placed in rogation week, at which time they used to meet there and had a sermond made to the people, and the last who preachd was the persone Crand in Queen Mary's tyme, as I have been credibly informed by a preist who had been an eye-witness." One of the stones was carried away and turned into a cheese-press, Nicolas Roscarrock proceeds to say, in or about 1580, "by a gentlewoman named Mistress Burlace." But after her death she "or something assuming her personage," was seen in the night carrying back the stone and replacing it where it had been before; and in Roscarrock's day all four were in their proper places.

S. Nectan is represented on the tower of the church, and in the west panel of the churchyard cross, habited as a Bishop.

S. NEOT, Hermit, Confessor.

Neot was nearly related to King Alfred. Leland (*Coll.* iv, 13) from a Life he saw at S. Neot's, Huntingdonshire, says that he was son of Adulf, King of Canterbury, and was brother of King Alfred. But adds a correction in a note, to the effect that he was nephew and not brother.

He was a man of very short stature. He was educated in Glastonbury Abbey, but the desire for a solitary life induced him to depart into Cornwall, and he retired into a hermitage formerly occupied by Gwyr or Guier, an ancient Cornish recluse.

It is said that he strongly urged upon King Alfred the establishment of public schools for the English people, doubtless having seen how that among the British the educational system was highly organised.

King Alfred held him in high esteem, and frequently consulted him. When Alfred was in retreat at Athelney, surrounded by marshes, and almost in despair of being able to drive the Northmen away, he lay down one night to sleep, but was unable to obtain rest. Neot was with him, and during the night cheered his flagging spirits with hopes. The colloquy with King Alfred seems to have formed the subject of a ballad, of which Leland has given a few lines extracted from the Latin life (*Ibid*, iv, p. 127).

It was due to the encouragement given him by S. Neot, that Alfred rallied his troops at Selwood.

Much legend has attached itself to S. Neot, such as the having the same fish in his well day by day to serve as his food, and his calling stags to harness themselves to his plough. This legend is illustrated in one of the fine old windows of S. Neot's church.

The saint died in 877.

The earliest life of the Saint is in Anglo-Saxon, and was published by G. C. Gorham, in his "History and Antiquities of Eynesbury and St. Neot," London, 1820, 2nd Ed., 1824.

A second Life, in Latin, written in the 12th century, was published by Mabillon, and is reprinted in the "Acta Sanctorum."

There is a modern Life by Whitaker, Lond., 1809, which is misleading. It does, however, contain two ancient Latin Lives from MSS. in Oxford, one in Latin elegiacs, the other in prose with Latin hexameters interspersed—probably that from which Leland quoted. A life by John of Tynemouth is in Capgrave's "Nova Legenda."

S. Neot's bones remained in Cornwall till 974, when they were stolen and carried off to the newly-founded monastery of S. Neot's, Huntingdonshire.

His Festival is on July 31, but curiously enough Whytford gives July 8.

At St. Neot's the Feast is kept on the last Sunday in July. The Holy Well there is in good condition.

Anciently Menhenniot (Men-hen-niot) was probably dedicated to him. The name signifies "The old stone of Neot."

ST. NEWLYNA, Virgin, Martyr.

The Church of Newlyn is described in the Episcopal Registers as *Ecclesia St^{ae} Neuline* (Bronescombe, 1263). Bishop Bronescombe dedicated it on reconstruction on the 26th September, 1259 (*Ecclesia Stae Niwelinde*). It is similarly described by B. Quivil, 1283, B. Bytton 1309; Bishop Grandisson, 1332, 1349, &c.; B. Stafford, 1400.

Newlyn is the same as the Breton *Noualen*, Latinised into *Noyal*. The name is from the Welsh *Niwl-wen*, White Mist. Nothing is known of her date or of the facts of her life.

Nicolas Roscarrock, writing about 1610, says that she was daughter of a king, who in contempt of the christian religion martyred her with his own hands. This is not quite the story as it is told traditionally in Brittany. There the story goes:—

That she was a virgin from Cornwall who crossed into Armorica, along with her nurse or foster mother, and came to Bignan in Morbihan, where she was put to death by a local chieftain named Nizam, who cut off her head. She is, in fact, a Breton *réplica* of S. Winefred. When she had been beheaded, she rose, took up her head in her hands, and carried it as far as Noyal Pontivy, full thirty miles. As shall be shewn presently this fable springs from a very simple cause.

Pontivy possesses a church richly decorated, dedicated to the Saint. Formerly there was a *jubé* or rood screen there, on which her legend was painted. This was wantonly destroyed in 1684, by order of the vicar-general, because it obscured the sight of a gaudy reredos in the debased style of the period. This tasteless construction has now been swept away, and the paintings that formerly decorated the *jubé* have been reproduced in stained glass in the parish church and on the walls of a chapel. In the chapel is a Holy Well. Through the courtesy of M. l'abbé de Bellez, curé of Noyal Pontivy, I am able to give the subjects of the old paintings that were destroyed, and the inscriptions under them, that were in Gothic characters, and were happily transcribed into the archives of the parish.

1. Comment Sanct Noial en son commencement hantait l'église et donnait lomone aux pavres pour l'amour de Dieu.

2. Comment Saint Noyale et sa nourrice passa la mer sur une feuille, et vindrent en Bretagne.

3. Comment un tirant nommé Nézin par auctorité cuida tant faire à Sainte Noyale renoncé a la loy de Dieu et estre son épouse.

4. Le dit Nézin cruel et desputé que la S^{te} vierge à luy ne s'était accordé en lieu qu'on appelle le Bezen la fit decoller et autres de sa compaignie.

5. Du dit Bezen Sainte Noyale porta sa teste, vint à Noyal, l'ange de Dieu si la conduit avesque sa nourrice.

6. Sainte Noyale et sa nourrice se reposa à la fontaine et picqua son bordon dont sortit une fresne. Dessus sur une pierre faiet sa prière, la merche y est encore entiers.

7. Sainte Noyale en ce mesme lieu si trepassa et alla à Dieu, auquel lieu s'entens estait désert pour le temps.

There are at Noyal Pontivy two chapels dedicated to the Saint; one is in the parish church, and the other on a spot rendered sacred by an incident in her legend of which mention presently.

There are also two other chapels in the village of S^{te} Noyale distant two kilometres from Pontivy, and the paintings of which the inscriptions have been given above are in one of these. The parish church was built in 1420, and was restored in 1888, when the stained glass window was erected, which not only gives the legend as on the *jubé* but filled out as current among the people. This is the series.

1. S. Noualhuen distributes her patrimony among the poor in Britain before crossing the sea.

2. The Saint traverses the English Channel on a branch of a tree. (The ancient representation made her cross on a leaf.)

3. S. Noalhuen is solicited in marriage by the chieftain, Nezen, but refuses him, saying that she had dedicated her virginity to Christ.

4. S. Noualhuen and her nurse kneel in prayer on a rock, and pray to be given the grace of perseverance.

5. The tyrant in a rage has Noualhuen decapitated. Local tradition has it that the Saint occupied a desolate spot in the

parish of Pontivy, but vexed by the pursuit of Nezin she withdrew to Bignan, seven leagues distant, and to a place called Le Bezou in that parish. Nezin hearing of her flight pursued her, renewed his solicitations, was again repulsed, and decapitated her there.

6. S. Noualhuen rose up, took her head in her hands, and returned to Pontivy along with her nurse.

7. Arrived there, she and her nurse knelt on a rock, still pointed out as bearing the impress of her elbows and knees. She planted her staff, and it became a tree.

8. Whilst on her way back, she heard a girl address her mother rudely; this so shocked her that she resolved on departing to a more solitary spot.

9. She accordingly pursued her course till she came to the edge of a vast forest, near a stream, and there she died.

10. Above her tomb a chapel was erected. Nizan or Nezin, full of wrath, resolved on its destruction, by damming up the stream. But the dyke burst, swept him away, and he was drowned.

It will be seen that by misplacing a picture, the story of her wanderings with her head in her hands may easily have originated. She fled from her pursuer, and the flight has been transferred to the period after her decapitation.

Unhappily no ancient "Life" of the Saint exists, and all we know of her is from legend. But legend is always based on a substratum of fact. The facts were probably these:—That Noalwen was one in a migration from Cornwall to Armorica, that the natives of Brittany did not relish this invasion, and under their chief Nezin opposed it; that several were slain, and among them Noalwen whom he attempted to gain possession of for himself.

Nizan or Nezin, the *plou* of the persecutor of the Saint, still bears his name attached to a parish that adjoins Noyal-Pontivy, and a strong feeling exists to the present day against a girl of Noyal-Pontivy seeking a husband in Nézin. A cantique in Breton is sung on the fête at Noyal-Pontivy to a popular Breton melody. It contains the legend run into verse.

S. Noualhuen is the patroness of two parishes in the diocese of Vannes, of two in that of Rennes, and of one in that of S. Brieu. Whether Newlyn West at one time had a chapel dedicated to the Saint, at the point whence she embarked for Brittany, and thence derives its name, we have no means of saying.

The "pardon" of S. Noualen in Brittany is on July 6.

S. Noyala appears in the Vannes Missal of 1586, and in the Vannes Breviary of 1660, on July 6.

Nicolas Roscarrock gives as her day April 27.

The feast at Newlyn is on November 8.

In Art she should be represented holding a sword, and trampling on Nizan.

S. Nox, Widow.

Non, the mother of S. David, also called Melaria, was a daughter of Gynyr of Caer Gawch and of Anna, daughter of Vortimer.

The situation of Caer Gawch, the Red Castle, has not been determined, but it was somewhere in the S. David's peninsula.

Sandde, grandson of Ceredig, the conqueror of Ceredigion of Cardigan, saw, loved, and seduced her. She was then at Ty Gwyn in the school of Mancen. Gildas, so says the legend, came to the place and was asked to preach, but found his tongue miraculously tied. He sent the people forth from the church, and yet remained speechless. Then he detected Non crouching in a dark corner, and discovered that he was silenced by the superior merits of her yet unborn child.

She is said to have retreated before her confinement to a habitation on the cliffs, and at the moment when her son was born to have laid hold of a standing stone, whilst a thunderstorm exploded overhead, and the lightning split the stone, upon which, long after, the impressions of her fingers remained. This stone was afterwards laid beneath the altar. This is doubtless a legend accounting for an ogham inscription, which could no longer be deciphered. In after times the habitation was converted into a chapel, and a mediæval superstructure reared upon it. It

is not orientated, and the substructure is so rude and cyclopean and mortarless, that it may very well date from the time of S. Non. Hard by is a Holy Well.

After David was born, Non took her child to be baptised at Porth Clais, where was S. Ailbe recently arrived from Ireland, and he admitted him to the Christian Church. The well where he was christened still flows.

The biographer of S. David assures us that she was of singular innocence of soul, and that she had no other children. This, however, does not agree with the Irish accounts, which speak of David having had sisters, Magna, mother of S. Setna, and Mor, mother of S. Ellen.

It is quite possible that the story of her seduction by Sandde is due to a misconception of the mediæval biographer, who found that she was called Non, and supposed that therefore she was a *Nun*, and he presents the outrage accordingly as being doubly odious. It is not unlikely that she was the wife of Sandde,—the son of a neighbouring prince or king, and it was not till after her husband's death that she retired from the world and became a nun. According to the Breton tradition her true name was Melaria, and this is not improbable, as Mechel, Marchel, or Melaria, daughter of Brychan is by one account represented as having been one of Gynyr's wives.

The sister of S. Non was S. Wenn (Gwen), the wife of Selyf Duke or King of Cornwall, who lived at Gallewick, "between the Lyner and the Tamar."

It was apparently due to this relationship, that Non was induced to settle in Cornwall. There her principal foundation was at Altarnon, an important parish comprising over 11,200 acres, with church, holy well, and sanctuary.

Another church bearing her name is Bradstone in Devon.

Another is Pelynt (Plou-nin), where there is a Holy Well.

Boyton church is supposed to be dedicated to the Holy Name (Nomen), but more probably had an earlier dedication to S. Non. The Holy Name is a comparatively modern introduction into the calendar. The festival was not introduced till between 1420 and 1500. In 1530, Pope Clement VII conceded

to the Franciscan Order, the use of an office for the Holy Name, but it was not till 1721, that Innocent XIII extended the observance to the whole Latin Church.

Boyton had had a church long before the introduction of the Holy Name into England. It is named in the Taxation of Pope Nicolas IV, 1288-91, and in the Register of Bishop Grandisson, 1360. The village Feast is in the second week in August, and the day of the Holy Name is August 7 in the Salisbury and York Calendars. The day, however, appointed for the commemoration by the Franciscans was January 14.

At Gram-pound is a chapel of S. Non ; and at Porthscatho in S. Gerrans is a Holy Well bearing her name.

William of Worcester, copying from the Calendar of S. Michael's Mount says " S. Nonnita, mother of David, lies in the church of Altarnon, where S. David was born."

That she may have been buried there is possible, but that S. David was born there is inadmissible. The Bretons, however, claim to have her tomb at Dirinon to the south of the Elorn that flows into the harbour of Brest. Indeed, a 15th century tomb is there shewn, erected over her sepulchre, with her statue on it. On the opposite side of the Elorn is a dedication to S. David under the name of Divy. S. Non's Holy Well is resorted to at Dirinon. A drama representing her story was for many years acted on her festival there ; an account and abstract of it have been printed in the " *Archæologia Cambrensis*" (1858).

Other dedications to Non in Brittany are Lagona-daoulas and Lagona-Quimerch in the Diocese of Quimper. Lagona is a corruption of Lann-nona ; but it is doubtful if this be not a totally different S. Non or Ninidh, a bishop.

In Wales the churches and chapels dedicated to her are :— Llanllwch Aeron, in Cardiganshire ; Llannon a chapel under Pembre, Carmarthenshire ; Llannon, formerly a chapel under Llansauffraid, Cardiganshire ; and the ruined chapel already spoken of near S. David's, Pembrokeshire.

In Wales S. Non was commemorated on March 3.

In Brittany her feast is on October 8.

The feast at Altarnon is on June 25 ; as also Pelynt ; according to William of Worcester, her day as observed at Launceston was July 3.

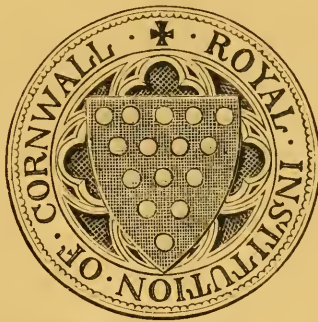
In the Tavistock Calendar, according to William of Worcester, there was an entry Sanctus Nin, Martyr, on June 15. One suspects three errors here, either in the original text or in Nasmith's printed edition, Sanctus for Sancta ; Martyr for Matrona, and Jun. xv for Jun xxv.

There is, however, a vague local legend that S. Nonna was put to death at Bradstone, her head struck off on the Broadstone, the capstone of a cromlech that gives its name to the parish.

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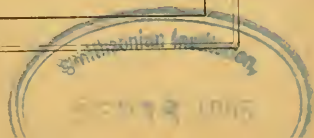
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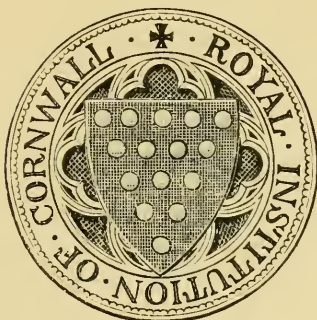
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Royal Institution of Cornwall

—◆—
 SPRING MEETING, 1904.
 —◆—

The Spring Meeting was held at the rooms of the Institution on Tuesday, the 17th May. The president (Sir Edwin Durning-Lawrence, Bart., M.P.) occupied the chair and there were also present the archdeacon of Cornwall, revs. S. Rundle, D. G. Whitley, St. A. H. Molesworth St. Aubyn, H. H. Mills, T. Taylor, H. Edwardes, W. E. Graves, S. H. Farwell Roe, Dr. Clark, Col. Horsford, Messrs. J. D. Enys, T. C. Peter, W. N. Carne, J. Osborne, H. James, W. A. Rollason, J. Barrett, W. Borlase, W. J. Clyma, E. H. Davison, G. Dixon, J. H. Morrish, A. Blenkinsop, J. E. Douglas, F. E. C. Soul, A. C. Dixon, R. J. Rowe, R. Michell, G. H. Thomas, H. Barrett, J. R. Collins, O. Blackford, J. L. Coad, Jas. Bryant, rev. W. Iago and Major Parkyn, F.G.S. (hon. secretaries) and Mr. G. Penrose (curator and librarian), Lady Durning-Lawrence, Mesdames St. A. H. Molesworth St. Aubyn, Farwell Roe, Graves, Pearse Jenkin, Morrish, Leverton, Borlase, Share, G. Dixon, Cornish, Rollason, Clark, Collins, the Misses C. Jenkin, Heath, Tomn, S. Tomn, Snell, Truran, Share, F. R. Dixon, Michell, Cornish, Burrell, and M. Reynolds.

Letters of regret at inability to be present were received from Canon A. P. Moor, the rev. S. Baring-Gould, Dr. R. Pearce, Messrs. J. H. Collins, R. Fox, A. P. Jenkin, T. Clark, and P. Jennings.

Sir Edwin Durning-Lawrence said he had to thank the members for the high honour they had conferred upon him by electing him president of the Royal Institution of Cornwall. Looking at the men of great ability and knowledge and position who had occupied the chair before him, he could not fail to realise how great an honour it was to be that day enrolled with them. He then delivered an address on steam in relation to Cornwall (which is printed in this journal).

The rev. D. G. Whitley read a paper on Ancient Lakes in Cornwall.

Mr. Geo. Penrose gave some particulars concerning two cinerary urns which had lately been found at Treworrick, near St. Ewe, and at Tresawsen, Merther, and the rev. W. Iago gave a description of the Burmese bell in the Bodmin Free Library, secured by the D.C.L.I., and presented to the borough.

Mr. J. D. Enys exhibited a short sword, found on Caradon, in 1847, sent by the rev. S. Baring-Gould, and also bones of the Moa, a New Zealand bird now extinct, which he had pleasure in presenting to the museum.

Rev. W. E. Graves proposed a vote of thanks to the readers of papers and to donors of gifts to the museum and library.—Dr. Clark seconded, and it was carried—On the motion of rev. St. A. H. Molesworth St. Anbyn, seconded by Mr. T. C. Peter, the president was thanked for his address.

STEAM IN RELATION TO CORNWALL.

ADDRESS BY THE PRESIDENT,
SIR EDWIN DURNING-LAWRENCE, BART., M.P.

It is universally recognised that the employment of steam power is the main factor that has changed altogether the conditions of the life of man by enabling him—in the words of Ralph Waldo Emerson—to “hitch his wagon to a star,” for in fact it is the power of the sun stored in coal or wood, etc., that we are using in our engines, whether worked by steam or by the explosion of gases.

How great has been the change effected not only in our material comfort but in our mental attitude was well expressed a year or two since by Mr. Arthur Balfour, when he stated that Dr. Priestley who died a hundred years ago (1804) would have met Dr. Hooke who died two hundred years ago (1702) on absolutely equal terms, but that he would have been farther away from our present modern thought than he was from the ideas of the old Assyrian philosophers who died five thousand years ago.

This enormous change is undoubtedly owing almost entirely to the use of steam—or if you will of heat-power—which not only enables nearly everything needed for man’s use to be made in practically unlimited quantities but provides facilities of rapid transit to all quarters of the globe while, by means of the electric cable, which could never have been constructed without its aid, information of passing events is brought hour by hour from the most remote regions almost at the very moment of their occurrence.

Now what has Cornwall especially to do with the use of steam? I venture to put forward the claim that it was mainly in order to work the mines of Cornwall that the steam engine was invented and that therefore Cornwall has played a greater part in the progress of the world than is generally conceded.

From the earliest ages man had known that a closed vessel containing a little water and put upon the fire would explode with great violence, and thousands of years ago earthquakes were attributed to a similar cause. The ancients also knew that steam issuing from an orifice would produce a recoil or re-actionary movement such as we see in a Catherine-wheel firework, or if directed against a cogged-wheel would cause it to rotate just as if you blew upon it with your breath. But so far as we can learn this knowledge only led to the production of scientific or amusing toys and was never applied to any really practical purpose.

But from the commencement of the seventeenth century numerous inventors in various parts of Europe proposed to make use of steam for the service of man. Still, however, no practical commercial result was actually achieved until Thomas Savery invented his engine for which he took out a patent No. 356 on 25 July, 1698. "A new invention for raising of water and occasioning motion to all sorts of Millwork by the impellent force of fire, which will be of great use and advantage for drayning mines, serving townes with water and for the working of all sorts of Mills, when they have not the benefit of water or constant winds." In the following year (1699) an act of parliament was passed "for the encouragement of a new invention by Thomas Savery for raising water and occasioning motion to all sorts of Millwork by the impellent force of fire."

The preamble says, "Savery having by much care and expense, since the grant of letters patent, greatly improved his invention, which is likely to be of great use to the Public, but which probably will require many years of time and much greater expense to bring to full perfection, for which its Author deserves better encouragement, it is enacted therefore, that at the expiration of the term of fourteen years granted by the letters patent, Savery shall for a term of twenty-one years, receive and enjoy the sole profits of his invention."

Savery, having protection under the patent of 1698 and under the act of parliament of 1699, extending therefore over 35 years, did not try to make any mystery of his invention, but published a very clear account of it in 1702 under the title of "The Miners' Friend." I myself possess an original copy of this work and if possible I intend to procure one for the Royal

Institution of Cornwall, but, as it is extremely valuable and interesting, I have thought it advisable to print it in extenso as an appendix to this address.

Smiles in his "Lives of the Engineers" tells us that Savery was born at Thilston, near Modbury (not far from Plymouth) and suggests that it is probable that he was led to this most important invention by the circumstance of his having been brought up in the neighbourhood of the mining districts and of his being aware of the great difficulty experienced by the miners in keeping their pits clear of water. The early tin-mining of Cornwall was for the most part what was called stream-work, being confined mainly to washing and collecting the diluvial deposits of ore. Mines usually grew out of these stream-works, the ground was laid open at the back of the lodes and the ore was dug out as from a quarry. Some of these old openings, called "Coffins," are still to be met with in different parts of Cornwall.

The miners did not venture much below the surface for fear of the water, but, as the upper strata became exhausted, they were tempted to go deeper in search of the richer ores. Shafts were sunk to the lodes, and these were followed underground. Then it was that the difficulty of water had to be overcome; for unless it could be got rid of the deeper ores of Cornwall were so much buried treasure. When the mines were of no great depth it was possible to bale out the water by hand-buckets. But this expedient was soon exhausted and the power of horses was then employed to draw the buckets. Sometimes, also, a whim or gin, moving on a perpendicular axis, was employed to draw the water. But in one pit after another the miners were being drowned out, and the operations of an important branch of national industry were in danger of being brought to a sudden conclusion.

It was under these circumstances that Captain Savery turned his attention to the contrivance of a more powerful engine for the raising of water; and after various experiments he became persuaded that the most effective agency for the purpose was the power of steam. The uses to which Savery proposed to apply his engine were various, but the most important in the inventor's estimation was its employment in clearing tin mines and coal pits of water.

From Savery's own account it is evident that several of his engines were erected in Cornwall and it is said that the first was tried at Huel Vor or the Great Work in Breage a few miles from Helston, then considered the richest tin mine in the county. The engine was found to be an improvement on the methods formerly employed for draining the mine and sent the miners to considerably greater depths. But the great pressure of steam required to force up a high column of water was such as to strain to the utmost the imperfect boilers and receivers of those early days; and the frequent explosions which attended its use eventually led to its discontinuance in favour of the superior engine of Newcomen which was shortly afterwards invented.

Thus far I have been mainly quoting from Smiles as shewing I am not over-estimating the part played by Cornwall in inducing the invention of the first practical steam engine.

I ought perhaps to refer to Edward, second marquess of Worcester, to whom the merit of the invention of the engine that Savery patented is sometimes ascribed by those who seem not to have investigated the matter with sufficient care. We know practically nothing of the marquess of Worcester's engine which never passed beyond the experimental stage, and although a patent for 99 years, from 1663 to 1762, was granted to the marquess of Worcester, yet Captain Savery and his successors under his patents which extended for 35 years from 1698 to 1733 compelled every user of Newcomen's and other steam engines to submit to the most grinding terms and no one attempted to plead that Savery's patents were invalidated by the marquess of Worcester's prior patents and as late as 1724 the Laird Wauchope was obliged to petition the holders of Savery's patents for a license to erect and use a fire engine (Newcomen's) having a stem or barrel (a cylinder) 28 inches in diameter and 9 feet in length and this was granted by the committee (Savery's) on his agreeing to pay £80 a year in quarterly payments during the term of the patent (Savery's) which then had eight years to run. The license contained a stipulation that if any payment was overdue for forty days the committee might enter and sell up the engines, boilers and everything, returning the over-plus to Mr. Wauchope. I think these facts dispose once and for all of the fallacious idea that Savery's engine was merely the marquess of

Worcester's engine. It also disposes of the theory which rests on no foundation of fact that Savery entered into any partnership with Newcomen or that Newcomen ever held any patent whatever, for which indeed no record can be discovered, Savery's patent being held to over-ride Newcomen's inventions.

Savery's engines continued to be erected up to and after the time of the complete steam engine of Boulton and Watt and in 1774 Smeaton showed that the consumption of coal in a Savery engine was about 30lbs. per horse power per hour, *i.e.* 7,000,000 lbs. raised 1 foot per cwt. coals.

And it is worth recording that the Savery engine is still to-day largely in use under the name of the "Pulsometer" all over the world; the only difference being in the addition of suitable valves originally patented by C. H. Hall 1872 (2885) and by the construction of modern wrought iron riveted boilers capable of producing steam of high pressure.

The pulsometer is still very wasteful in its use of steam, but it is very inexpensive in construction and it never wears out, the only moving parts being the valves which are easily renewed. And it possesses the great advantage of being able to pump out coal and refuse from the holds of ships or mud and sand and pebbles from excavations, while it will work satisfactorily when suspended from a chain and requires no fixing.

I must now glance for a moment at Newcomen and his engine. Thomas Newcomen was an ironmonger of Dartmouth about fifteen miles from Modbury where Savery lived and to him is undoubtedly due the honour of first constructing a machine which was a true engine in the modern sense of the word. I do not purpose describing this engine except by saying it had a boiler and cylinder with a piston which, when the steam below it was condensed, was forced down by the pressure of the atmosphere and its descent pulled down a great working beam to the other end of which were attached the pump rods.

In 1712 Newcomen and his partner Calley contracted to erect an engine at Wolverhampton. Next they erected two engines near Newcastle. The fourth was put up at Leeds in 1714. The fifth was erected in Cornwall in 1720 at Wheal Fortune and was on a larger scale than any previously constructed, having a

cylinder of nearly four feet in diameter and its performance was regarded as extraordinary since it made fifteen strokes a minute and drew up at each stroke about a hogshead of water from a depth of 180 feet.

The cost in coal was very great but it saved the mine and made the beginning of the fortunes of Mr. William Lemon who afterwards removed to Truro and began working the Great Gwennap Mines on an extensive scale. This Mr. Lemon is the founder of the great Cornish family so well known here.

In 1725 another engine was erected at Wheal Rose near Redruth, under the superintendence of Joseph Hornblower who afterwards erected another at Wheal Busy, Chacewater, and a third at Polgooth.

Engines of Newcomen's pattern continued to be erected long after Newcomen's death, till there was scarcely a tin or copper mine of any importance in Cornwall that had not one or more of such engines at work.

Smeaton, the celebrated engineer, who brought this class of engine to the highest perfection of which it was capable, erected at Chacewater in 1775 the finest and most powerful that had until then been constructed, having a cylinder 6 feet in diameter and a maximum stroke of 9 feet 6 inches. But as Price, writing in 1778, tells us in the appendix to his "*Mineralogia Cornubiensis*" the vast consumption of coal of these engines, amounting in cost to about £3,000 per annum, was almost a fatal drawback. Still, in 1780 there were, as Smeaton informs us, eighteen large engines at work in Cornwall, many of which were built by Jonathan Hornblower and John Nancarrow. Of these men a good deal is known, but biographers have altogether failed to trace any personal history of Thomas Newcomen, the great inventor of the steam engine.

I shall again refer to the Hornblowers later, but we must now pass to James Watt, the great magician who at a bound made the real steam engine which worked, not by the pressure of the atmosphere, which could never equal 15 lbs. to the square inch, but by the power of the pressure of steam which is only limited by practical considerations and is used to-day up to 150 lbs. and often much more, per square inch. Watt's great invention includ-

ing the separate condenser was patented in 1769 (No. 913) and in 1775 by an act of parliament his rights were extended to 25 years from 22 May, 1775.

Smiles tells us that long before Watts arrived in Birmingham, the Cornish miners had been in communication with his partner, Matthew Boulton, and several orders for engines for Cornwall were received at the Soho Works by the end of 1776. The two first ordered for Cornwall were those for Wheal Busy near Chacewater and for Ting Tang near Redruth. The materials for Wheal Busy were shipped in 1777, and, as much would depend upon the successful working of the first engines put up in Cornwall, Watt himself went to superintend their erection. At Chacewater he found himself in the midst of what was then the richest mining district in the world, and upon the success of the Chacewater engine the whole future of Boulton and Watt seemed to depend. Writing in August, 1778, Watt says "Chacewater [Wheal Busy] Engine is our capital card, for should it succeed in 'forking' this mine, all doubts will then be removed." In another letter written soon after he says: "By attending to the business of this County [Cornwall] alone, we may at least live comfortably, for I cannot suppose that less than twelve engines will be wanted in two or three years, but after that very few more, as these will be sufficient to get ore enough, though you cannot reckon the average profits to us at above £200 per annum per engine."

I should mention that Boulton and Watt exacted, for the use of each engine, an annual payment originally calculated on the saving in coal, and after much contention the owners of the Chacewater engine agreed to pay £700 per annum, and a few years later the adventurers of the "Wheal Virgin" mine agreed to pay £2,500 a year for working five new engines. This was subsequently reduced to £1,000 per annum. But continual efforts were made by the workers of the Cornish mines to lessen the sums exacted for licenses; finally, however, one year before Watt's patent expired, viz. in 1799, all Watt's rights against infringers were sustained by the judges and arrears from single mines exceeding £4,000 were recoverable. About 1780 Boulton hired what was called a mansion at Cosgarne near Gwennap which he and Watt occupied in turns as business took them to Cornwall and, indeed, the partners at one time contemplated transferring

themselves altogether to Cornwall, although Watt, always a desponding man, wrote of the Cornish climate—"It rains here prodigiously. When you come, bring with you a waxed linen cloak for yourself and another for me, as there is no going out now for a few miles without getting wet to the skin. When it rains in Cornwall, and it rains often, it rains *solid*."

The single acting engine was only available for pumping, although in exceptional cases the water pumped was used to turn a water-wheel by which to work machinery. How then can I claim for Cornwall the honour of the steam machinery that now does the main work of the world? Let us look at the double acting engine as perfected and patented by Watt in 1784. Its very appearance with its great rocking beam proves what is known historically to be true—that it was the pumping engine of Cornwall that had been modified and adopted to rotatory motion. And for half a century the beam seemed to be considered almost a necessary part of a steam engine intended for any purpose. Early steam ships were all fitted with beams which, in the case of ocean-going boats, were subsequently modified by being placed (shall I say upside down?) below the cylinder instead of above it. And to-day in many of the most powerful river boats of North America the great rocking beam is still seen above the deck, moving up and down as if it were an engine for pumping water.

It is also a singular fact that the first really successful model locomotive was made in 1784 by William Murdock (Watt's foreman) and tried at Redruth in Cornwall. The model, which was about 18 inches long, was fitted with what was called a "grasshopper engine," *i.e.* worked, not with a whole beam but, with half a beam.

This same form of engine was also used in U.S. America by Oliver Evans who unsuccessfully applied to the Pennsylvania Legislature in 1786 for a patent for steam engines (high pressure) for driving mills and steam carriages, and in 1800-1 commenced to construct a steam carriage and in 1804 did make a sort of amphibean dredge which propelled itself through the streets and also in the water. In this curious boat which had wheels to go on land, and a stern paddle wheel propeller for water, he used the grasshopper beam. So likewise the half beam was used by

Wm. Hedley who took out a patent (No. 3666) in 1813. The engine that he constructed at Wylam for Mr. Blackett has now been placed in S. Kensington Museum where it can be seen. It solved the problem of traction on iron rails and worked successfully for forty years. It was known as the "Puffing Billy" from the name of its maker, and was frequently seen by George Stephenson, and there can be no doubt that his knowledge of Hedley's engine assisted Stephenson in producing his own engine which was the parent of the modern locomotive as we know it to-day.

But I have no intention of giving a history of the development of the steam engine, although that most fascinating story has not even yet been fully told. My object is rather to refer to the connexion of our county of Cornwall with that development. William Morshead, junr., 17th Nov., 1863, at the Institute of Civil Engineers (John Robinson McLean, V.P. in the chair) said "Cornwall may justly be considered as the birthplace and home of the steam engine. It was for draining its mines that the engines of Savery and Newcomen were designed; and to the early encouragement afforded by the Cornish miners may be attributed no small share of the success which attended Watt."

Last year in the October 23rd number of the journal called "Engineering" is a report of a paper read 16th Oct., at the Institute of Mechanical Engineers by Mr. Henry Davey a member of the council, entitled "The Newcomen Engine" which Mr. Davey writes me he is now about to republish in a pamphlet form. But I will avail myself of a few of the interesting particulars which he collected with so much trouble, and also of some of the letters in reference to his lecture which were published in "Engineering" at about the same date. Drawings and details are given of the Newcomen winding engine at Farne Colliery, Rutherglen, Glasgow, which Sir Wm. Arroll, M.P. told me a few days ago he himself had seen quite recently still at work as it had been working since its erection by John McIntyre in 1818. Mr. Alexander Henderson, the manager, wrote me on the 9th instant (May, 1904):—

"The old Farne Colliery engine is still in active work although only drawing coals from the two upper seams in the old pit, say from 100 to 120 tons per day, mainly to relieve the other pit.

“It has no separate condenser, having the water jet still below the piston, the water supply coming from a tank fixed above the roof, and kept filled by a bucket fixed on the lower end of the tappet rod.

“This engine...is by no means economical in coal.... The engine has a fly wheel.... There has also been added a boiler feed pump on fore end of beam, this was not required when it had its own boilers as they were fed from a cistern high enough up to give the pressure, some 3 lbs. I believe. I have often heard an old engine-man speak of the boilers boiling over, also of patching them with a sod and a brick. The engine is now supplied with steam from a receiver fed by a reducing valve reducing the pressure from 40 lbs. down to 10 lbs., but when the engine is going the pressure in the receiver falls to about 2 lbs.

“There are two valves only, worked by hand, and some of the mechanical details are very curious compared with present day practice. When the valve lever is level both valves are closed, on depressing it below level, the steam valve is raised admitting steam below piston and breaking the vacuum when the weight of the heavy solid connecting rod assists the little pressure to draw up the piston. (There was at one time a heavy sleeve on the rod to help this). At the same time the finger of the injection valve drops down to the bottom of the two suspending links and so leaves it undisturbed; the steam at the same time blows out any water in the cylinder through the foot valve (a common flap one). The valve lever is weighted in such a way that when the lever is level both steam and water pressure tend to keep it so and both valves closed, but the farther the lever is shifted either way the more weight is thrown on to help it; this was to steady the lever when going self-acting with tappets on the plug rod.

“The spindles are packed and kept tight by simply a turn of hemp and kept up to it by a cramp. The valves are brass $7\frac{1}{2}$ " dia., the seats are merely placed on the bottom of the casing, and held down by two L shaped keys driven in above them.

“The engine goes very well and gives no trouble, or as little as our modern high speed couples do, and if it has any good point it is that a blacksmith can make any repairs needed.

“The strangest thing to my mind is that the cylinder requires to be regularly scaled like a boiler from the scale deposited by the injection water ; it seems funny to think of such a thing.”

As late as 1899 a Newcomen engine continued to work at Coalbrookdale. Another at the works of the Ashton Vale Iron Company at Bristol, believed to have been erected about 1750 or 1760, remained at work till it was pulled down in 1895, but no doubt certain renovations were made from time to time. But it had been worked by an old man since he was a boy, and by his father and by his grandfather before him.

Another erected at Caprington Colliery in 1806 is believed to have been originally built between 1770 and 1780 and worked without separate condenser up to July, 1901.

Numerous others are referred to by various correspondents, but these examples are sufficient to show the persistent vitality of the original Newcomen engine.

Mr. Davey, with the assistance of Mr. Richard B. Prosser, gives the following chronological table :—

- 1698. Thomas Savery of London obtained a patent for raising water by the elasticity of steam ; Savery's engine had no piston.
- 1702. Savery's "Miners' Friend" published. Savery's advertisement in *Post Man*, March 19th to 21st, notifying that this engine may be seen at work "at his workhouse in Salisbury Court, London." This advertisement was printed in *Notes & Queries*, 27 January, 1900. (9 Ser. vol. lxiv).
- 1712. Newcomen erected an engine near Dudley Castle for a Mr. Back of Wolverhampton. This engine had a water jacket around the cylinder condensing the steam, but afterwards injection in the cylinder was adopted. All valves worked by hand.
- 1712 to 1718. A buoy used to give automatic action to the injection cock.
- 1714. A Newcomen engine said to have been erected at Wheal Vor in Cornwall, and another at Ludgrove in 1720.

1715. Savery died in London.
1717. December 29. Calley (or Cawley) died whilst erecting an engine at or near Ansthorpe, Yorkshire. This is from the burial register of Whitkirk. See Farey's Steam Engine, p. 155.
1718. Beighton invented the "hand gear." The steel-yard safety-valve was introduced, also the snifting valve and the shortened eduction-pipe, with its non-return valve. All the essential features of the perfected engine were now present.
1720. Newcomen went into Cornwall and erected an engine at Wheal Fortune. Another engine on the same model was erected at Pool Mine in 1746.
1721. An advertisement in the Daily Courant, 24 July, 1721, beginning "Whereas an engine to raise water by Fire, commonly called Savery's engine," and inviting attention to a new form of engine. The above was printed in Notes and Queries, 27 January, 1900 (9 ser. vol. 64). See also Notes and Queries, 17 February, 1900 for a communication from J. E. Hodgkin.
1725. Joseph Hornblower erected an engine at Wheal Rose, near Redruth, a second engine was erected at Wheal Busy, and a third at Polgooth, April 8. Steam engine at work at Tipton, Staffordshire. (On this day the son of John Hilditch "Manager of ye Fire engine at Tipton" was baptised in the parish church of Bilston. The Engineer, 11 November, 1898).
1729. Newcomen died in London.
1733. July 24. Savery's patent expired, having been in existence for 35 years.
1758. Many engines at work in Cornwall, one at Herland having a 70-in. cylinder. (Wm. Emerson describes in detail the Newcomen engine as then used).
1767. Smeaton first turned his attention to the atmospheric engine.
1769. Smeaton computed the duty of fifteen engines in the Newcastle-on-Tyne district, and found the average duty

to be 5.59 million on one bushel of 84 lbs. of coal.
January 5. Watt's first patent.

1770. Smeaton made note of eighteen large engines in Cornwall, eight of which had cylinders from 60 in. to 70 in. in diameter.
1772. Smeaton made improvements in details, not altering the general construction, and succeeded in obtaining a duty of 9.5 millions.
1775. Smeaton erected a Newcomen engine at Chacewater in Cornwall. The steam cylinder was 72 in. in diameter. Water load, $7\frac{2}{3}$ lbs. Lift of pumps, 360 ft. This engine was altered by Watt to his system.
1776. Watt corresponded with Smeaton and claimed 21.6 millions duty for his engines. Smeaton, after making experiments with Watt's engines, laid it down as a general rule that the Watt engines did double the duty of the Newcomen.
1777. Watt erected three more of his engines in Cornwall, his first having been erected the previous year. In these engines the load on the piston was increased from the 8 lbs. in the Newcomen to 11 lbs. or 12 lbs. in the Watt engines.
1778. Smeaton found that a Watt engine at the Birmingham Canal did a duty of 18 millions, and one at the Hull Water Works 18.5 millions. Two engines at Poldice were found to do a duty of 7 millions on one bushel of coal.
1781. October 25. Watt's second patent.
1800. Watt finished his labour in Cornwall, having raised the duty of his engines to 20 millions.
1810. A Newcomen engine was erected at the Farme Colliery, Rutherglen, Scotland, for winding and pumping; in 1820 another was added for winding, and in 1821 another, having a 60 in. cylinder, for pumping.

Newcomen had associated with him Cawley, a plumber and glazier, and it will be observed that the pipes of the engines were at first made of lead with plumber's joints. In the early days the steam-cylinders only were obtained from iron-founders

and the other parts of the engine were built by local blacksmiths, carpenters and plumbers, under the direction of an engineer.

The engine was first fixed on a boiler of a haystack form, but the vibration of the engines so loosened the joints that it was found advisable to secure the cylinder to strong wooden beams above the boiler. At a later date the engine was fixed on a separate foundation by the side of the boiler, and as time went on, iron pipes were substituted for lead, and, the wagon boiler was introduced to take the place of the haystack.

Among the first erectors of the Newcomen engine were the Hornblowers in Cornwall. Newcomen visited Mr. Potter of Bromsgrove and erected an engine near Dudley Castle in 1712. This is the historical engine in which injection in the cylinder was first used.

In the vicinity lived Joseph Hornblower, an engineer, who became acquainted with Newcomen's engine, and who was sent for into Cornwall about 1720 to 1725, to erect an atmospheric engine at Wheal Rose Mine near Redruth.

It may be interesting here to observe, on the authority of Cyrus Redding, a great-grandson of Joseph Hornblower and author of "Yesterday and to-day," etc., etc., that the Newcomen engine was not such a simple machine as only to require the attention of boys, as stated in popular histories, but that it required the united exertion of three men to start the engine.

A second engine, it appears, was erected by Hornblower at Wheal Busy, or Chacewater Mine; a third at Polgooth. Joseph Hornblower then left the county, and his son Jonathan came down and erected his first engine at Wheal Virgin about 1743. The fourth son of Joseph was Jonathan Carter, the inventor of the compound engine and the double beat steam valves, who died at Penryn in 1815.

From 1720 to 1740 few engines were erected in Cornwall because of the high duty on sea-borne coal. In 1741 an act of parliament was passed for the remission of the duty on coal used for fire engines for draining tin and copper mines in the county of Cornwall. The effect of the passing of this act was that by the year 1758 many engines had been brought into use; one engine at Herland had a 70-in. cylinder.

Rotative Atmospheric Engines. It appears that attempts were made as early as 1768 to produce a rotative motion from a Newcomen engine; but it was not till about 1780 that it was successfully accomplished by the use of the crank. It does not appear that any attempt was made, before Watt's separate condenser was invented, to reduce the cooling effect of the injection water on the cylinder by effecting the condensation in a small vessel attached to the cylinder. It is however evident that, after Watt's patent, Newcomen engines were made with separate condensers without air pumps, the air being discharged through a snifting valve. The condensers were known as "pickle-pots."

I think it may be of interest to give here a copy of the Table of Engine work, as now exhibited at South Kensington Museum, shewing the number of lbs. raised one foot per hour by the consumption of 112 lbs. of coal.

1718	Newcomen	4,300,000
1767	Newcomen, Smeaton & Beighton	7,400,000
1774	Smeaton	12,300,000
1774	Watt	21,000,000
1778	Watt with expansion	31,000,000
1800	Watt do.	66,000,000
1842	The Cornish Engine	100,000,000
1883	Water-works Engine	120,000,000

To the above may be added:—

1774	*Savery, according to Smeaton's } calculations }	7,000,000
1904	The old Farme Newcomen } engine as now working }	16,000,000

In order to confirm my statement how much the world owes to Cornwall for the introduction and the perfection of the steam engine, I think I must make special reference to one or two men of great ingenuity who worked in Cornwall.

Joseph Hornblower the elder came to Cornwall in 1725 to erect a Newcomen engine at Wheal Rose, near Redruth. He erected various other engines in Cornwall and settled in Salem, Chacewater (though it is stated he died in Bristol). His son,

*Horse power as applied to the steam engine was invented by Savery; it is 33,000 lbs. raised one foot per minute or almost exactly 2,000,000 lbs. raised 1 ft. per hour.

Jonathan, came to Cornwall in 1745 and built steam engines. He had six sons of whom four assisted him in his business as engineers. The fourth son, Jonathan Carter Hornblower, who was born in 1753 at Chacewater, was a man of distinguished ability and in July, 1781, patented the double cylinder steam engine, some form of which is now almost universally used, not only for fixed engines, but for steam boats and locomotives of great power. In a letter which was published in the *Edinburgh Encyclopedia*, p. 1192, Hornblower says :

“In the year 1776 I determined to make a small steam engine for my own amusement, but wished to produce something new I made a model which succeeded so well that I recommended it to my father He was of opinion that as I had proposed a lid on the steam vessels and a rod of iron to move through a collar of tow in the lid, there would be more friction than could be dispensed with ; and also that as the pistons would require frequent repair, the cylinder lids must be unscrewed as often as that was done. I therefore had no other thought at that time about it than to amuse some of my friends by a working model. In 1778 Mr. Watt came into the country with his much improved steam engine ; and seeing him make use of our cylinder lid and piston rod in the same manner as I had proposed to apply them, the matter was again revived and a friend directing me where to find a representation by a copper plate of thirty years standing of a Steam-engine with a lid on the cylinder and a rod moving through it connected to the piston, I therefore completed another model on a larger scale, in 1781, obtained a patent and have since proved it to be capable of producing nearly the effect of any other steam engine, with the same quantity of fuel.

“In plate are two steam vessels or cylinders closed at top and bottom ; in which are two pistons that are fastened to two iron rods These are connected to the inner end of the great lever, the largest at the extremity and the small one at a proper distance between that and the lever wall, they are turned very true and move through a collar of tow and grease quite steam tight,” &c.

In 1792 a bill was introduced in parliament to extend the term of Hornblower's patent and the “case” (or petition) in favour of the bill commences as follows :—

“At a very early period of Mr. Hornblower's life he conceived an Idea of improving the Steam Engine and in 1776 (previous to his knowledge of any other kind than those invented by Mr. Newcomen) made a small working Model, the Effect of which he exhibited to a confidential friend.

“The principle he set out upon, was perfectly new and consisted in a secondary application of the Steam to produce a new Action by the intervention of a second Steam vessel.

“In all other Machines of the kind, it was, and is, usual, after one Operation of the steam on the Piston to condense or destroy it,” &c., &c., &c

Hornblower was not successful in obtaining his act of parliament, and he was finally crushed by the decision of the Law Courts that his engines were an infringement of Watt's patents.

But I think it is a matter of great interest to us here to-day to refer to the numerous letters that passed between Hornblower and his great patron and friend, Mr. Davies Giddy, M.P., when we remember that Mr. Davies Giddy (who on his marriage in 1808 changed his name to Davies Gilbert) was the grandfather of our friend of that name who resides at Trelassick and also of John D. Enys of Enys.

Mr. Davies Gilbert, M.P., was a very distinguished man of science and a fellow of the Royal Society, of which he became president in succession to Sir Humphrey Davy. In connection with the steam engine, Mr. Davies Giddy made in 1792 diagrams of the expansion action of steam exactly in the form such diagrams are constructed in to-day.

This is not, however, a fitting occasion to discuss the respective merits of Watt and Hornblower, so I must be content with this brief reference to the very valuable mass of correspondence between Hornblower, Mr. Davies Giddy and others, which still remains in the possession of Mr. John D. Enys.

There is another great Cornish name I must not omit—Richard Trevithick, senior, who married Miss Anne Teague and was a friend of “Wesley,” and was manager of Dolcoath and of several other mines. In 1775 he re-erected at Dolcoath (the year before Watt's first Cornish engine), the old Carloose engine which had been made by Newcomen about fifty years previously. At that work Arthur Woolf, the father of Arthur Woolf, the well-known

engineer, was employed, receiving $1/5$ per day as a carpenter. Richard Trevithick, senior, died 1797, but before that time his son Richard Trevithick, the celebrated engineer, had already come into prominence. He, like Hornblower, found a patron and friend in Mr. Davies Giddy, whose grandson, Mr. J. D. Enys, possesses the original drawing of one of his water-power engines erected in 1799. At about that time Trevithick turned his attention to using high-pressure steam without condensation and in 1800 made several high-pressure portable engines and erected a high-pressure steam whin. In the following year he constructed at Camborne a locomotive that was able to carry several persons. In the Christmas of that year 1801, he joined in partnership with Capt. A. Vivian and on 16 January, 1802, having come up to London to secure a patent for their locomotive and other high-pressure engines, wrote to Mr. Davies Giddy giving an account of an interview with Count Romford, F.R.S., who with Sir Humphrey Davy and Mr. Davies Giddy assisted them in preparing their specifications for the patent which they obtained in that year 1802. The drawings and descriptions are very clear but it was almost impossible at that time to manufacture a suitable wrought-iron boiler, the largest piece of wrought-iron plate procurable being about three or four feet long and a foot wide. Trevithick was therefore frequently forced to fall back upon cast-iron boilers strengthened with wrought-iron. In a report of a select committee of the house of commons appointed in May, 1817, to enquire into the use and safety of Trevithick high-pressure marine engines, the evidence shewed the cause of a recent steam-boat explosion to have been a deficiency in the strength of the end of the boiler, which was of cast-iron, but appeared to have been previously of wrought-iron which had been cut and cast-iron substituted. The report adds "and further a great majority of opinions leans to boilers of wrought-iron or metal in preference to cast-iron." Still as early as 1804 Trevithick made a locomotive with steam blast in the chimney which drew ten tons on a tramway at the rate of nearly 4 miles an hour for nearly ten miles partly up a considerable incline.* This is considered the first

* I am, by the courtesy of Mr. J. D. Enys, enabled to give the accompanying illustration of Trevithick's engine, which the sister of Mr. Davies Gilbert named "Catch me who can," and in her memorandum says "My ride with Trevithick in the year 1808, in an open carriage, propelled by the steam engine of which the enclosed is a print, took place on a waste piece, now Torrington Square."

successful application of steam power to the haulage of loads on a railroad and there seems evidence that Trevithick's engine was one of the causes that assisted in the production of the "Puffing Billy" of William Hedley that was the direct parent of Stephen-



son's first engine. Trevithick also proposed to apply a screw propeller to ships and was in many ways a wonderful pioneer inventor, but in spite of the assistance of Mr. Davies Giddy (Gilbert) and other scientific men, he was unable to achieve commercial success, no doubt owing very much to the impossibility of obtaining high-class tools or skilled mechanics at that time.

But the progress of steam in the world owes much to the great Cornishman Richard Trevithick.

I conclude, therefore, as I commenced, by asserting that it cannot be contested that the world's progress to-day is mainly

owing to the use of steam, and that it is undoubtedly true that to our county of Cornwall in an especial measure belongs the honour of finding the means of harnessing this product of the power of the sun, and thereby making it the most useful of the servants of man.

APPENDIX TO PRESIDENT'S ADDRESS.

The following pages contain a copy of Savery's "The Miners' Friend," the title page and figures being facsimile reproductions, and the spelling and punctuation of the original text being carefully retained.

The book contains VII and 84 pages. The printing occupies $5\frac{1}{4} \times 2\frac{3}{4}$ inches on each page.

The Miners Friend ;
OR, AN
ENGINE
TO RAISE
WATER
BY
FIRE,

DESCRIBED
AND
Of the manner of Fixing it in
MINES.

WITH
An Account of the several other Uses it
is applicable unto; and an

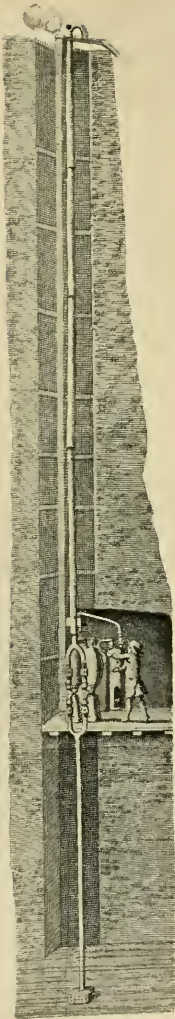
ANSWER
To the OBJECTIONS made against it.

By *THO. SAVERY* Gent.

*Pigri est ingenii contentum esse his, quæ ab
aliis inventa sunt. Seneca.*

LONDON: Printed for *S. Crouch* at the Corner of
Popes-Head-Alley in *Cornhil.* 1702.

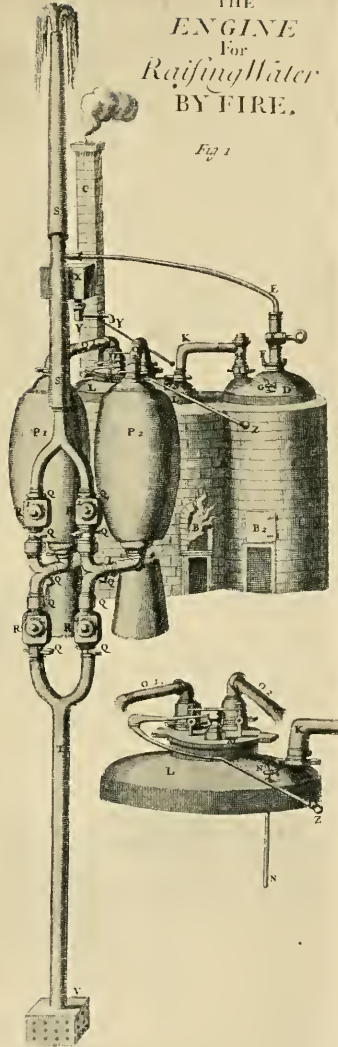
Fig 2



The
ENGINE
Working in a
MINE.

THE
ENGINE
For
Raising Water
BY FIRE.

Fig 1



R. 1. 261. 461a 1 Short copy

TO THE KING.

Sir,

Your Majesty having been graciously pleased to permit an Experiment before you at Hampton-Court of a small Moddle of my Engine described in the following Treatise, and at that time to shew a seeming Satisfaction of the Power and Use of it: And having most graciously enabled me by your Royal Assent to a Patent and Act of Parliament to persue and perfect the same. By which your Royal Incouragement, it being now fully Completed, and put in Practice in your Dominions, with that repeated Success and Applause: That it is not to be doubted but it will be of Universal Benefit and Use to all your Majesties Subjects. Of whom your Majesty being the Universal Patron and Father, all Arts und Inventions that may promote their Good and Advantage. seem to lay a just and natural Claim to your Majesties Sacred Protection.

'Tis upon this Consideration I am incouraged with a profound Respect to throw this performance of mine, with the Author, at your Majesties Royal Feet, most humbly beseeching your Majesty, That as it had Birth in your Majesties Auspicious Reign, You will vouchsafe to perpetuate it to future Ages by the Sanction of your Royal Approbation, which is the utmost Ambition of,

May it please your Majesty,

Your Majesties

most Humble,

most Loyal,

and most Obedient

Subject,

THO. SAVERY.

TO THE ROYAL SOCIETY.

At the Request of some of your Members at the Weekly Meeting at *Gresham-Colledge*, June the 14th 1699. I had the honour to work a small Moddle of my Engine before you,

and you were pleased to approve of it. Since which I have met with great Difficulties and Expence, to instruct Handicraft Artificers to forme my Engine according to my Design; but my Workmen, after so much Experience, are become such Masters of the thing, that they oblige themselves to deliver what Engines they make me, exactly tight and fit for Service, and as such I dare warrant them to any Body that has occasion for them.

Your kindness in countenancing this Invention in its first Appearance in the World, gives me hopes the Usefulness of it will make it more acceptable to your Honourable Society, as they are the most proper Judges of what Advantage it may be to Mankind. And it would be ungrateful in me not to make use of this Opportunity to return you my most humble and hearty Thanks for the Honour and Favour you did me in Approving my Design, and *publishing it to the World; which shall be always acknowledged by

Your most obliged

and most humble

Servant,

THO. SAVERY.

TO THE GENTLEMEN ADVENTURERS IN THE MINES OF ENGLAND.

I am very sensible a great many among you do as yet look on my *Invention* of raising *Water* by the impellent force of *Fire*, a useless sort of a *Project*, that never can answer my *Designs* or *Pretensions*; and that it is altogether impossible that such an *Engine* as this can be wrought *under-ground*, and succeed in the *Raising* of *Water*, and *Dreining* your *Mines*, so as to deserve any Incouragement from you. I am not very fond of lying under the *Scandal* of a bare *Projector*, and therefore present you here with a *Draught* of my *Machine*, and lay before you the *Uses* of it, and leave it to your Consideration, whether it be worth your while to make us

* Philosoph, Transact. Numb. 252.

of it or no. I can easily give grains of allowance for your *Suspensions*, because I know very well what *Miscarriages* there have been by People *Ignorant* of what they *pretend* to. These I know have been so *frequent*, so fair and *promising at first*, but so short of *performing* what they pretended to, that your *Prudence* and *Discretion* will not now suffer you to *believe* anything without a demonstration, your *Appetites* to *new Inventions* of this nature, having been *baukt* too often; yet after all, I must beg you not to *condemn* me, before you have *read* what I have to *say* for my *self*, and let not the *failures* of *others* prejudice me, or be placed to my account. I have often lamented the want of understanding the true *Powers of Nature*, which misfortune, has of late put some on making such vast *Engines* and *Machines*, both *troublesome* and *expensive*, yet of *no* manner of *use*, inas-much as the *old Engines*, used many *Ages* past, far exceeded them. And I fear, whoever by the *old Causes* of Motion pretends to *Improvements* within this *last Century*, does *betray* his *Knowledge* and *Judgment*. For more than an hundred years since, *Men* and *Horses* would *Raise* by *Engines* then made, as much *Water* as they have ever since done, or I believe ever will, or according to the *Law of Nature* ever can do. And though my *Thoughts* have been long employed about *Water-works*, I should never have pretended to any *Invention* of that kind, had I not *happily* found out this *new*, but yet a much *Stronger* and *Cheaper Force* or Cause of Motion, than any before made use of. But finding this of *Rarefaction by Fire*, the consideration of the *Difficulties* the *Miners* and *Colliers* labour under by the frequent *Disorders*, *Cumbersomness*. and in general of *Water-Engines*; *Encouraged* me to *invent Engines to work* by this *new force*, that tho' I was obliged to *incounter* the *oddest* and almost *insuperable* *Difficulties*; I spared neither *Time*, *Pains* nor *Money*, till I had absolutely *Conquer'd* them. I hope this will at least encourage you to *read* over this *small Treatise* I now put into your hands, for the farther and more particular *Information* of the *Nature* and *Uses* of this *Engine* for raising *Water* by the *Force of Fire*: After which I shall patiently *submit* to any *Judgment*

you shall please to *pass* upon *me* or the *Invention*, and may have reason to believe you will not any longer suffer your *Judgments* to be imposed on by *those*, whose *Profit* and *Interest* it may seem to be, to *Condemn* both right or wrong; I mean such who make your common *Ginns*, and their *Friends* and *Acquaintance* among you; tho' I am very sure the promotion of the *Use* of this *Engine* is their true *Interest*, as I very plainly prove thus:

The cheaper *Water* is drawn, the more is the *Miner* encouraged to adventure; the more the *Miner* adventures, the more *Pits* or *Shafts* must be *sunk*; the more *Shafts* or *Pits* are sunk, the more *Wood-work* will be necessarily employed in *Timbering* them, or supporting the sides from *falling* in where the *Earth* is loose; besides *Windelesses* and all other *Utensils* of *Wood* used in *Mines*, or the *Trades* depending *thereon* must be more, which by increasing the *Carpenters Trade* in general, will make them sufficient *amends* for the *loss* of a small part of that *Branch* of their *Trade*, called *Ginn-making*. As for *Pump-making*, that part of the *Trade* will be much *Improved* by my *Engine*. For I must use *Board* and *Timber* for *Pipes*; and have considerable *Employment* for *Pump-makers* and *Carpenters* for *Timber* used about my *Engine*. But shall never *Employ* any other *Person* in making *Pipes*, or any other *Carpenters* work I shall have to do, but the *Person* who was before *employed* in the *Work*, or such as shall be recommended, as a *Person* employed in the *Mines* of the *Country* wheresoever I shall fix *Engines*; provided they will work as cheap, and fairly, and observe the *Orders* and *Directions* given them. For my *Design* is not in the least to *prejudice* the *Artificers*, or indeed any *other* sort of *People*, by this *Invention*; but on the contrary, is intended for the *Benefit* and *Advantage* of *Mankind* in general, especially the *People* of my own *Nation*; and wherein, you *Gentlemen* concern'd in *Mines*, may, if you please, *Reap* the greatest *Profit*.

And altho' I do not question but the *Plan*, and *Draught* of my *Engine*, will be very well and readily understood with *many* *Gentlemen*, by the *Description* here given; yet it will require a longer *Time* in *Others*, to employ their *Minds* and

Thoughts more Intensely about it; especially such as have not been *familiar* and acquainted with *things* of this *kind*. But should the *Engine*, to the Apprehension of some, seem *intricate* and difficult to be worked, after all the *Description* I have given of it in this *Book*; yet I can, and do assure them, That the *attending* and working the *Engine* is so far from being so, that it is familiar and *easy* to be learned by those of the *meanest Capacity*, in a very little time; insomuch, that I have Boys of 13 or 14 years of *Age*, who now *attend* and *work* it to perfection, and were *taught* to do it in a few days; and I have known some *learn* to work the *Engine* in *half an hour*. We have a Proverb, That *Interest* never lyes: And I am assured that you *Gentlemen* of the *Mines* and *Collyeries*, when you have once made this *Engine* familiar in your Works, and to your Selves and Servants; not only the *Profit*, but abundance of other *Advantages* and *Conveniencies*, which you will find to attend your Works in the Use thereof, will create in you a favourable Opinion of the Labours of

Your real Friend

London, Sept. 22,
1701.

and humble Servant,

THO. SAVERY.

A DESCRIPTION OF THE DRAUGHT OF THE ENGINE, FOR RAISING WATER BY FIRE.

A. The Furnaces.

B B. The two *Fire* places.

_{1 2}

C. The Funnel or Chimney.

D. The *small* Boyler.

E. The Pipe and Cock of it.

F. The Skrew that Covers and Confines its Force.

G. a small Cock a Pipe going within Eight Inches of its Bottom.

H. a larger Pipe going the same Depth.

I. a Clack on the top of the said Pipe.

K. a Pipe going from the Box of the said Clack or Valve, into the *great* Boyler, about an Inch into it.

- L.* The great *Boyle*.
- M.* The *Skrew* with the *Regulator*.
- N.* a small *Cock* and *Pipe* going half way down the great *Boyle*.
- O. O.* $\frac{1}{2}$ Steam-Pipes, one end of each *Skrew* to the *Regulator*, and the other ends to the *Receivers*.
- P. P.* $\frac{1}{2}$ The Vessels called *Receivers*.
- Q.* The *Skrews* which bring on the *Pipes* and *Clacks* in the Front of the *Engine*.
- R. R. R. R* N° 1. 2. 3. 4. *Valves* or *Clack* of *Brass*, with *Skrews* to open and come at them upon occasion.
- S.* The *Force-Pipe*.
- T.* The *Sucking-Pipe*.
- V.* a square *Frame* of *Wood*, with *Holes* round its *Bottom* in the *Water*.
- X* a *Cistern* with a *Buy-Cock* coming from the *Force-Pipe*.
- Y.* a *Cock* and *Pipe* coming from the bottom of the said *Cistern*.
- Z* The *Handle* of the *Regulator*.

 CHAP. I.

THE MANNER OF WORKING THE ENGINE.

The first thing is to *fix* the *Engine* in a good *Double Furnace*, so contrived that the *Flame* of your *Fire* may *Circulate* round, and *Incompass* your two *Boylers* to the best advantage, as you do *Coppers* for brewing. Before you make any *Fire*, unskrew *G* and *N*, being the two small *Gauge Pipes* and *Cocks* belonging to the two *Boylers*. And at the holes fill *L* the *Great Boyle* two thirds full of *Water*, and *D* the *Small Boyle* quite full. Then skrew in the said *Pipes* again as fast and tight as possible. Then *Light* the *Fire* at *B* N° 1. When the *Water* in *L* *boyls*, the *Handle* of the *Regulator* mark'd *Z*, must be thrust from you as far as 'twill go, which makes all the *Steam* rising from the *Water* in *L*, pass with irresistable *Force* through *O* N° 1. into *P* N° 1. pushing out all the *Air* before it, through the *Clack* *R* N° 1. making a *Noise* as it goes. And when all is gone out, the *Bottom* of the Vessel *P* N° 1. will be very hot. Then pull the

Handle of the *Regulator* to you, by which means you *stop* *O* *N*^o (1.) and *force* your *Steam* through *O* *N*^o 2. into the *P* *N*^o 2. until that *Vessel* has discharg'd its *Air* through the *Clack* *R* *N*^o 2. up the *force* *Pipe*. In the mean time, by the *Steams* *condensing* in the *Vessel* *P* *N*^o (1.) a *Vacuum* or *Emptiness* is created. So that the *Water* must and will necessarily *Rise* up through *T* the *sucking* *Pipe*, lifting up the *Clack* *R* *N*^o (3.) and filling the *Vessel* *P* *N*^o 1.

In the mean time the *Vessel* *P* *N*^o (2.) being *Emptied* of its *Air*; turn the *Handle* of the *Regulator* from you again, and the *Force* is upon the *Surface* of the *Water* in *P* *N*^o (1.) which *Surface* being only *heated* by the *Steam*, it does not *condense* it, but the *Steam* *Gravitates* or *Presses* with an *Elastic* *Quality* like *Air*; still increasing its *Elasticity* or *Spring*, till it *Counterpoises*, or rather *Exceeds* the *Weight* of the *Water* ascending in *S*, the *Forcing* *Pipe* Out of which the *Water* in *P* *N*^o (1.) will be immediately *discharged* when once gotten to the top, which takes up some time to *Recover* that power; which having once got, and being in work, it is *easy* for any one that never saw the *Engine*, after half an hours *Experience*, to *keep* a constant *Stream*, running out the *full* *Bore* of the *Pipe* *S*. For on the *out-side* of the *Vessel* *P* *N*^o (1.) you may see how the *Water* goes out, as well as if the *Vessel* were *Transparent*. For as far as the *Steam* continues within the *Vessel*, so far is the *Vessel* *dry* *without*, and so very *hot*, as scarce to *endure* the least touch of the *Hand*. But as far as the *Water* is, the said *Vessel* will be *cold* and wet, where any *Water* has faln on it; which *cold* and moisture *vanishes* as fast as the *Steam*, in its *Descent*, takes place of the *Water*. But if you *force* all the *Water* out, the *Steam*, or a small part thereof, going through *R* *N*^o (1.) will *rattle* the *Clack*, so as to give sufficient notice to *pull* the *Handle* of the *Regulator* to you; which at the same time begins to *force* out the *Water* from *P* *N*^o (2.) without the least alteration of the *Stream*; only some times the *Stream* of *Water* will be somewhat stronger than before. If you *pull* the *Handle* of the *Regulator*, before any considerable quantity of *Steam* be gone up the *Clack* *R* *N*^o (1.) But it is much better to let none of the *Steam* go off, (for

that is but losing so much strength) and is easily prevented, by *pulling* the *Regulator* some *little* time before the *Vessel* forcing is quite *emptied*. This being done, immediately *turn* the *Cock* or *Pipe* of the *Cistern* *X* on *P* N^o (1.) so that the *Water* proceeding from *X* through *Y* (which is never open, but when *Turned* on *P* N^o (1.) or *P* N^o 2. but when between them, is tight and stanch) I say, the *Water* falling on *P* N^o (1.) causes by its *Coolness* the *Steam* (which had such great *force* just before) to its *Elastick* power, to *Condence*, and become a *Vacuum*, or empty Space. So that the *Vessel* *P* N^o (1.) is by the *External* Pressure of the *Atmosphere*, or what is vulgarly called *Suction*, immediately *Refilled*, while *P* N^o (2.) is *emptying*; which being done, you push the *Handle* of the *Regulator* from you, and throw the *Force* on *P* N^o (1.) pulling the *Condensing Pipe* over *P* N^o 2. causing the *Steam* in that *Vessel* to *Condense*, so that it *Fills* while the other *Empties*. The labour of *Turning* these *two* parts of the *Engine*, *viz.* the *Regulator* and *Water-Cock*, and *Tending* the *Fire*, being no more than what a *Boys* strength can perform for a *day* together, and is as easily learn'd as their driving of a *Horse* in a *Tub-Gin*: Yet, after all, I would have *Men*, and those too the most apprehensive, employed in working of the *Engine*, supposing them more careful than *Boys*. The difference of this Charge is not to be mention'd, or accounted of, when we consider the vast *Profit* which those who use the *Engine* will Reap by it.

The *Ingenious Reader* will probably here *Object*, That the *Steam* being the *Cause* of this *Motion* and *Force*, and that *Steam* is but *Water* *Rarified*, the *Boyle* *L* must in some certain time be *emptied*, so as the work of the *Engine* must stop to *replenish* the *Boyle*, or indanger the *Burning out*, or *Melting* the bottom of the *Boyle*.

To *Answer* which, please to observe the Use of the *small Boyle* *D*. When it is thought fit by the *Person* tending the *Engine* to *Replenish* the *great Boyle* (which requires an hour and half, or *two hours* time to the sinking *one foot* of *Water*) then, I say, by *turning* the *Cock* of the *small Boyle* *E*, you *cut off* all *Communication* between *S* the *great Force-Pipe*, and *D* the *small Boyle*, by which means *D* grows

immediately *hot*, by throwing a little *Fire* into *B N 2.* and the *Water* of which boyls, and in a very little time it gains more strength than the *great Boyler*. For the *Force* of the *great Boyler* being perpetually *spending* and going out, and the other winding up, or *increasing*, it is not long before the *Force* in *D* exceeds that in *L*; so that the *Water* in *D*, being Deprest in *D* by its own *Steam* or *Vapour*, must necessarily *Rise* through the *Pipe H*, Opening the *Clack I*, and so go through the *Pipe K* into *L*, Running till the *Surface* of the *Water* in *D* is equal to the *bottom* of the *Pipe H*. Then *Steam* and *Water* going together, will by a *Noise* in the *Clack I*, give sufficient assurance that *D* has Discharged and *Emptied* it self into *L*, to within *eight Inches* of the *bottom*. And inasmuch, as from the *top* of *D* to the *bottom* of its *Pipe H*, is contained about as much *Water* as will *replenish L* one Foot. So you may be certain *L* is replenished one foot of course. Then you open the *Cock I*, and *refil D* immediately. So that here is a *constant Motion*, without fear or danger of Disorder, or *Decay*: If you would at any time know if the *great Boyler L*, be more than half *Exhausted*, turn the small *Cock N*, whose *Pipe* will deliver *Water*, if the *Water* be above the *Level* of its *Bottom*, which is half way down the *Boylers*; if not it will deliver *Steam*. So likewise will *G* shew you if you have *more* or *less* than eight Inches of *Water* in *D*, by which means nothing but a *stupid* and wilful Neglect, or *mischievous Design*, carried on for some hours, can any ways hurt the *Engine*. And if a *Master* is suspicious of the *Design* of a *Servant* to do *Mischief*, it is easily *discovered* by those *Gauge Pipes*: For if he come when the *Engine* is at *work* and find the *Surface C* of the *Water* in *L*, below the *bottom* of the *Gauge-Pipe N*; or the *Water* in *D* below the *bottom* of *G*, such a *Servant* deserves Correction, tho' three hours after that, the *working* on would not *Damage* or *Exhaust* the *Boylers*: So that in a word, the *Clacks* being in all *Water-works*, always found the better, the *longer* they are used. And all the *Moving* parts of our *Engine*, being of like nature, the *Furnace* being made of *Sturbridge*, or *Windsor-Brick*, or *Fire-stone*; I do not see it possible for the *Engine* to *Decay* in many Years: For the

Clacks, Boxes, and Miter-Pipe, Regulator and Cocks, are all of Brass; and the Vessels made of the best hammered Copper, of sufficient thickness to sustain the Force of the Working the Engine. In short, the Engine is so naturally Adapted to perform what is required, that even those of the most ordinary and meanest Capacity, may work it for some Years without any Injury, if not hired or employed by some base Person on purpose to Destroy it. For after the Engine is once fixed, and at work, I may modestly affirm that the Adventurer, or Supervisor of the Mine, will be freed from that perpetual Charge, Expence and Trouble of Repairs, which all other Engines ever yet employed in Mines for the Raising of Water, are continually liable unto.

CHAP. II.

OF THE USES THAT THIS ENGINE MAY BE APPLIED UNTO.

It may be supposed that there are few *People* among us so ignorant, but must necessarily know of what *value* the Falls of *Water* are in most Places, as being applicable to *Mills*; which are made after various Kinds and *Forms*, according to the different Genius and *Abilities* of the *Mill-right*; for *Mill-work* being in a manner infinitely diversified; and had I leisure to Comment thereon, and give you an Account, not only of the vast variety that I have seen and heard of; but (when encouraged) what may yet be brought to work by a steady *Stream*, and the *Rotation* or Circular Motion of a *Water-wheel*, it would swell these Papers to a much larger *Volumn* than was at first designed, and frustrate my intended *Brevity*. I only just hint this to shew what Use this *Engine* may be put to in working of *Mills*, especially where *Coals* are cheap.

I have only this to urge, That *Water* in its *Fall* from any determinate *Height*, has simply a *Force* answerable and equal to the *Force* that *Raises* it. So that an *Engine* which will *Raise* as much *Water* as two *Horses*, working together at one time in such a *work*, can do, and for which there must be

constantly kept *ten* or *twelve* Horses for doing the same. Then I say, such an *Engine* will do the *work* or *labour* of *ten* or *twelve* Horses; and whereas this *Engine* may be made *large* enough to do the *work* required in employing *eight, ten, fifteen, or twenty* Horses to be constantly maintained and kept for doiog (*sic.*) *such a work*; it will be improper to stint or *confine* its Uses and Operation in respect of *Water-Mills*.

2. It may be of great Use for *Palaces*, for the Nobilities or Gentlemens *Houses*: For by a *Cistern* on the *top* of a *House*, you may with a great deal of *Ease*, and little Charge, *throw* what Quantity of Water you have occasion for to the *top* of any *House*; which Water in its fall, makes you what *sorts* of *Fountains* you please, and supplys any *Room* in the *House*. And it is of excellent *Use* in case of *Fire*, of which more hereafter.

3. Nothing can be more *fit* for serving Cities, and Towns *with water*, except a *Crank-work* by the *force* of a *River*. In the Composing such sort of *Engines*, I think no Person hath excelled the Ingenious Mr. *George Sorocold*. But where *they* are forced to Use *Horses*, or any *other* strength, I believe no Ingenious Person will deny this *Engine* to have the *Preference* in all *Respects*, being of more *Universal* Use than any yet *Discovered* or *Invented*.

4. As for *Draining Fens* and *Marshes*, &c. I suppose I need say no more than this, That that *Force* which will *Raise* great Quantities of *Water* a height of above 80 Foot, must necessarily *deliver* a much *greater* Quantity at a *lesser* height. And that it is much *cheaper*, and every way *easier*, especially where Coals are Water-borne, to *continue* the Discharge of any *Quantities* of Water by our *Engine*, than it can be done by any *Horse-Engines* whatsoever.

5. I believe it may be made very *useful* to Ships, but I dare not meddle with that matter; and leave it to the Judgment of those who are the best Judges of Maritain Affairs.

6. For *Draining* of *Mines* and *Coal-Pits*, the Use of the *Engine* will sufficiently *recommend* it self, in raising *Water* so *easie* and *cheap*; and I do not doubt, but that in a few *years*,

it will be a *means* of making our *Mining Trade*, which is no *small part* of the *Wealth* of this *Kingdom*, *double*, if not *treble* to what it now is. And if such vast Quantities of *Lead*, *Tin*, and *Coals* are now *yearly* exported, under the *Difficulties* of such an *immense Charge* and *Pains* as the *Miners*, &c are now at to Discharge *their water*. how much more may be hereafter *Exported*, when the *Charge* will be very much *lessen'd* by the Use of this *Engine*, every way fitted for the Use of *Mines*? For the far *greater* part of our *richest Mines* and *Coal-Pits*, are *liable* to two grand *Inconveniencies*, and thereby rendred *useless*; *viz.* The *Eruption* and *Excess* of *Subterraneous Waters*, as not being worth the *Expence* of *Draining* them by the great *Charge* of *Horses*, or *hand Labour*. Or secondly, *Fatal Damps*, by which *many* are struck *blind*, *lame*, or *dead* in these *Subterraneous Cavities*, if the *Mine* is wanting of a due *Circulation* of *Air*. Now *both* these *Inconveniencies* are naturally *remedied* by the *work* of this *Engine* of raising *water* by the impellant Force of *FIRE*.

For the *Water*. Be the *Mine* never so *deep*, each *Engine* working it 60, 70, or 80 foot high, by applying or *setting* the *Engines* one over another, as shall be shew'd at large hereafter in the following Pages, you may by a sufficient number of *Engines* keep the *bottom* of any *Mine* *dry*; and when once you know how large your *Feeder* or *Spring* is, it is very *easy* to know what siz'd *Engine*, or what number of *Engines* will do your business.

The *Coals* used in this *Engine* is of as little value, as the *Coals* commonly burned on the *Mouths* of the *Coal-Pits* are: For an *Engine* of a three Inch-bore, or thereabout, *working* the *Water* up 60 foot high, requires a *Fire-place* of not above *twenty* Inches deep, and about *fourteen* or *fifteen* Inches wide, which will occasion so small a Consumption, that in a *Coal-Pit* it is of no account, as we have Experienced. And in all parts of *England* where there are *Mines*; *Coals* are so *cheap*, that the *Charge* of them is not to be mentioned, when we consider the vast quantity of *Water* raised, by the inconsiderable *value* of the *Coals* used and *burnt* in so small a *Furnace*. What the quantity of *Coals* used for one *Engine* in a year

is, cannot easily be ascertained, because of the different Nature of the several sorts of Coals.

As for the Cure of *Damps* by this *Engine*, the Air perpetually crowding into the *Ash-hole* and *Fire-place*, as it is natural for it to do, and with a most impetuous Force discharged with the *Smoak* at the top of the Chimney, the *contiguous* Air is successively following it; so that not only all *Steams* or Vapours whatsoever, that may or can *arise*, must naturally *force* its way through the *Fire*, and so be *discharged* at the top with the *Smoak*. But this Motion of the *Fire* will occasion the *fresh Air* to descend from above, down all the *Pits*, and every *where* else in the *Mine*, but down the *Chimney*; provided you have a heading Drift, or Passage from all the Shafts, or Pits in the Work, to that place where the *Engine* stands, whether the *Mouth* of the said *Pit* and Chimney be *lower* or *higher* than the Mouths of any of the rest of the *Pits* or *Shafts* in the same *Work*, it matters not; for here will be a perpetual *Circulation* of the *Air*, and with that *swiftness*, as is hardly to be *believed*. This I have tryed, and know to be true; so leave the Ingenious Miner to his own Judgment, Whether when all the Air is in a swift Motion, that any Stagnation of Air (which has always been adjudged the cause of *Damps*) can happen in any *Pit*.

CHAP. III.

THE MANNER OF FIXING THE ENGINE FOR WATER-MILLS, PALACES, AND GENTLEMENS SEATS AND DREINING FENS, AND SUPPLYING HOUSES WITH WATER IN GENERAL.

1. For *Mills*. The *Engine* must be made and proportioned according to the Quantity of *Water*, required to *Drive* the *Mill* you would make Use of. Now suppose you would make a *Mill* on a plain place, where you will have only a *Pond*, and a small *Spring* of *Water* no bigger than a Quill; then you must build your *Mill-house* thirty six foot high, in which you may make what Motions, and what sort of *Mills*

you please. By the side of which House without, may be placed your *Water-wheel* of thirty two, thirty three, or thirty four foot *Diameter*. For the height of either House or Wheel, I would confine no Person too exactly, but I guess that a convenient height, and no more then what is common enough Under the *Wheel* I would have a *Pond*, and on the top of the House a *Cistern* of *Wood*, lined with *Lead*. The *Engine* may be fixed in any Corner of the Mill-House, 20, 21, 22 feet or more from the Level of the Pond: There two *Boylers* must be fixed, as shewn you in the Draught for fixing the *Engine*; and round each of them it is convenient to have a Hoop of Iron, with straps coming from them to rest on the Brick-work, to support and strengthen them. Your *Clacks* and *Pipes* in the *Front* being supported by Wood, and the Vessels standing on *Pedestals* of Wood, it is convenient that the *Flew*, or *Chimney* be so contrived, as to draw very *sharp*, and the *Flew* to *Circulate* round both the *Boylers*, so that you may lose no part of your strength.

2. For Palaces or the *Nobilities* or *Gentlemen's Houses*, you may fix the *Engine* in any remote or out-Room, whose *Floor* is not above twenty foot from the *Level* of your *Water*, and you may continue your Force-Pipe to the *top* of your *House*, with a convenient *Cistern* to hold your *Water*. Into which lay the *Pipes* which may convey the *Water* as you want it, either for *Pleasure* or *Common Occasions*. This way of *Cisterns* on the *top* of your *Houses* or *Palaces*, would be of singular *Use* in case of *Fire*, as is said before; for in every *Stair-Case* a Pipe may go down the Corner, or behind the *Wainscot*, so as to be no *Blemish* even to the finest of *Stair-Cases*. At every Floor there may be a *Turn-Cock* with a *Skrew*. At the utmost end, have likewise a small *Leather-Pipe*, kept well oyled, in a Cup-board or Cavity in your Wall, which may not be seen, but on the opening some part of the *Wainscot*; or such other Contrivance as Ingenious *Builder* shall think fit to make use of. This *Pipe* of *Leather* must be long enough to reach from the *Landing-place* or *Stair-head*, in all *Rooms* depending thereon. One end of this *Pipe* has a *Skrew* to fit the *Cock* in the other *Pipe*; and at the other end a *Pipe* like the *Nose* of a pair of *Bellows*.

So that wherever, tho' under a *Bed*, or the *remotest* part of any *Room* in the *House*, the *Fire* breaks out, or is discovered, any *Servant* having *Skrewed* the *Pipe* to the *Cock*, *stops* the *Nosle* with his *Thumbs*, till he comes to the *place* where the *Fire* is, when taking away his thumb, he by directing the *Nosle* to the *Fire*, immediately *extinguishes* it, which being liable to be instantly used, I think a *House*, *Palace*, &c. that has this *Invention*, may be said to be morally out of *Danger* of being *Destroyed*, or so far injured, as *Whitehall* and *Kensington* have been within a few years. This *Command* of *Water* must be allowed to be of vast advantage to any *House* whatsoever. Where *Brewing*, *Washing*, &c. is used, The *Copper* standing *high*, may be filled as easie as if it stood *low*, by which means, the hot *Liquor* may be contrived to go to all your *Coolers*, and other *Vessels*, either by a *Cyphon*, *Stop-Cock*, &c. without the *Hand-labour* of *Pumping* or *Bailing* with *Buckets*. But more *Conveniencies* than we can at present foresee, will be discovered in the *Use* of this *Engine*, for *Palaces*, *Houses*, &c.

3. For *Fens*, and the like, it is convenient that these *Engines* be made very large: For at all small *Heights*, a small quantity of *Fire* will deliver *prodigious* Quantities of *Water*. For suppose we *Force* but thirty foot, and *suck* twenty foot, if the *Boyle* does not fill the *Vessels* called *Receivers*, with *Steam* strong enough to *Counterpoise* or *Exceed* the *Force* of the *Atmosphere*, or *Spring* of the *Common Air*, it will discharge them at so small a *Height* as thirty foot *Force*, in a very *little* *Time*: And the *Steam* having very little *Force* or *Spring*, is immediately *Condensed*, so that it will presently *suck* full in one of the *Vessels*, while the other is *Discharged*. Now inasmuch as the *Fire*, being more or less, *adds nothing* to the *Suction*, I think such *Lifts*, being seldom *above* thirty-six foot, or *under* six foot, all the *Directions* farther *needful* for fixing the *Engine* for this *Use*, is in all *Lifts* under *twenty four* foot, to place your *Engine*, so as a little above your *Force-Clacks*, may be the place of the *Delivery* of your *Water* into a convenient *Trough* or *Lander*, to be carried off at the most proper place for its *Discharge*. If it be any *Height* above *twenty-four* foot, you

have nothing to do but to continue the *Length* of your *Force-Pipe* to the *Height* required. It ought to have a Shed or Covering round it, and to be placed at the *lowest* place of your *Fenn* or *Bogg*, as other *Engines* designed for that purpose commonly are.

As for fixing the *Engine* in *Ships*, when they may be thought probably useful, I question not but we may find conveniency enough for fixing them.

In *Mines* and *Coal-Pits* the manner of *fixing* the *Engines* is this; Your *Pit* being sunk, and a *Sump* or proper *Well* or bottom *Cistern*, made to receive the *Water* coming from the several *Feeders* or *Springs*. Supposing an *Engine* carrying $3\frac{1}{4}$ Inch Bore, is to be fixed to deliver *Water* about seventy foot *high*, constant running a full Bore; in such Case you make a small Room in your *Shaft* or *Pit*, which, together with your *Shaft* or *Pit* is nine foot square every way. As for Example; Suppose your *Shaft* six foot by four. take three foot out of one side, and five out of another Perpendicular nine foot, making a small *Floor* or *Platform* of *Boards* over that part of the *Shaft* which goes down to your *Sump* or bottom *Cistern*, so you have a compleat Room big enough for your *Engine*, where ten or twelve People may stand on occasion. This *Floor* may be about *eighteen*, *nineteen*, or *twenty* foot from the *Water*, at the lowest you ever will draw the *Water* into the *Sump* or bottom *Cistern*. If your Ground be *loose*, 'tis convenient to Line this *Room* with *Brick*; if *Rock*, it may support it self. But in this the *Miners* Judgment must direct him. That the *Engine* will stand best in the side of the *Pit*, where most is digged away, you may see in the second Figure of the *Engine*, being fixed in a *Mine*. Your *Pipes*, &c. must be *fixed* with *Cramps* of *Iron*, *Wood*, or such *Materials* as are convenient to the side of the *Pit* or *Shaft*, so as to make it stand as *firm* as the very *Shaft* it self. Your *Furnace* must be so contrived, that your *Flame* take a *turn* or two *round* each of the *Boylers*. which any *Bricklayer*, used to *Furnaces*, can do; it being performed by running a row of *Bricks* round them both like a *Skrew* or *Worm*; which being *contiguous* to the *Wall* of the *Furnaces*, and the *Boylers*, makes it as it were a *Worm*

Funnel round them both; from whence you may continue your *Chimney*, to the top of your *Work*, which you fasten to the sides of your *Shafts* in the *Corners* as you please, either with Iron or Wood, or both, according to the nature of the Ground. And wherever you make a sudden Bent or Nook near a Right Angle in the *Chimney*, have a loose *Brick* or *Stone*, to take out the *Soot*, if any should settle in such place, which in long working it may do.

SEVERAL OBJECTIONS AGAINST THE WORKING
THIS ENGINE ANSWERED, IN A DIALOGUE
BETWEEN A *MINER* AND THE *AUTHOR*.

Miner. Sir, Having been some time concerned in the *Engines* now used for drawing *Water* out of our *Mines*, and hearing so much Talk of *this* wonderful *Invention* of yours of Raising *Water* by *Fire*, I was very desirous to Enter into some Discourse with you, concerning the Nature, Use, and Application of your *Engine*, so strangely *differing* from *all* other *Engines* ever yet *Invented* for our Works, and which you positively affirm will every way *tend* so much to our *Advantage* in the *Use* of them; and I do not doubt of meeting with that Plainness, Freedom, and good Humour, that your Discourse is generally accompanied with. And with the same *Freedom* Resolve me in *such Questions* as the General Sense of us *Miners*, may *Naturally* propose to *Object* against the Use of your *Engine*, especially such of us, as are yet *Ignorant* of its *Use* and Operation, who are more capable to Judge of *Fact* than of the *Nature* and Power of that *Force* which Raises your *Water*.

Author. Sir, I am extremely Obligated to you for your Freedom; and shall readily Imbrace all Opportunities to Inform and *Explain* to you the *true Use* and *Nature* of my *Engine*. And therefore desire you with all imaginable Freedom to proceed, and ask what Questions you please, either as to your own *Thoughts*, as well as what has been *suggested* to you by *Others*. And you may be assured of a *plain* and *canded Answer* to all your Objections.

Miner. Then Sir, which way will you go to *work* with your *Engine* to clear an *Old Work* full of *Water*.

Author. Why Sir, to deal plainly with you, if your *Shafts* are, or may be cut *streight*, your *Tub-Engines*, or *Chain Pumps*, may draw forth the *Water*. And the Charge in that respect is not to be accounted for; because no *Mine* would be thrown up or *neglected*, but on account of the *Feeders* or *Springs*, which being certain, and *constantly* to be carried off Winter and Summer. The prospect of being likely to succeed, makes your *Mine* worth working or *emptying*, within twenty foot of the Bottom, if ever they were worth sinking, though you *work* or *Drain* by the common way of *Tubs* or *Chain-Pumps*. And could the constant Charge of those *Engines* be afforded, *Numbers* of them will *Empty* and keep under any *Work*; but it is the constant Charge of carrying off what the *Springs* bring in, is the chief thing to be *considered* in the Business of *Mines*, which constant Charge is what we lessen very much by this *Engine* of mine.

Miner. What signifies your *Engine* then, Sir, if it be not capable of *Sinking* or *Forking* an *Old Mine*.

Author Hold my good Friend, a little patience; I have dealt plainly and impartially with you about the *Use* of your *Old Engines*: And for my *Engine*, it will clear an *Old work*, if full of *water*, as readily as your *Tub-Gins* or *Chain-Pumps*, provided the *Shafts* are good. The Method I propose to *Clear* an *Old Mine*, if *fifty* foot deep, and full of *water*, the *Feeders* not above *two* Inch-bore, which is done at a very small Charge after this manner; *viz.* I fix my *Engine* on the top of the *Mine*, and only *suck* and deliver a $3\frac{1}{4}$ Inch-bore; as soon as we have *sunk* the *Water* as far as our *Suction* will go, which will be some 22, 24, or 26 foot *deep* below the Surface. There I make a *Room* fit to receive another *Engine*, which I *fix* with his *Force-Pipe* to go up to the top of the *Pit*; and when I have *sunk* about 24, or 26 foot more: Then I fix a *smaller Engine* of *two* Inches-bore, which *sucking* twenty, and *forcing* forty, does your work, and keeps all safe: Or let your *small Engines* be kept at *Work*, while you remove the *larger Engine* from the top to the middle

Station, and then you will have Occasion for no more than *two* Engines; the *greatest* of which may be removed as soon as the *smaller* is *fixed* in the lowest or proper *Station*. And that you may be convinced of my Impartiality, it is my Opinion, That in gaining an *Old Work*, or sinking a *New One*, you use your *Old Engines* of *Tub* or *Chain-Pumps*: This *Engine* of mine being most proper, when you are come fairly to the *Bottom* either of the *Oar* or *Coal*: For then, if you have but one *Lift*, one *Station* or *Engine-Room* will be sufficient. And by having two *Sumps* or *Bottom Cisterns*, your *Water* may in some measure *settle* in *one* of them, in its passage to the *other*. So that the *Miners* working tolerable clean, and suffering as little dead or loose *Coal* or *Oar*, as is possible, to mix with the *Water*, you may have the *Water* to draw only a little *discoloured*; for you know as well as I, that generally the *Water* coming from *Mines* or *Coal-Pits*, while they work by the *Gins* now in use, is almost *clear* *Water*.

Miner. Sir, I thank you for your Candor in relation to the clearing of an *Old Work*. But supposing that our *Water* arises thick and *muddy*, which you know will some times happen, what shall we do with your *Engine* then?

Author. What you say Sir, I know to be very true, that some times you have thick *muddy* *Gravel* and nasty *water*. To prevent which from coming in to, or offending our *Pipes*, we have a *Frame* of *Board* made full of *Holes* round about the *Bottom* of our *Pipe*, that receives the *Water*; for *Sluge* or fine *Dirt*, it will do my *Engine* no Injury. Indeed the clearer our *Water* is in our *Boylers*, the better it is for our *Work*; but for our *Receivers* and their *Clacks*, you may clear them as you Work it, from *Stones*, *Coal*, *Oar*, or any other *Anoyance*, though hung in the very *Clack*; for by *emptying* of one or both the *Receivers* of their *water*, you cause the *Motion*, either of *Suction* or *Force*, immediately to be so strong, as to clear and blow out all before it to the *Top* of the *Pit*. Insomuch that I have found Filings of *Copper*, large Bits of *Metal*, considerable Quantities of *Coal* and *Stone*, delivered and thrown up with the *Water* out of my *Engine* above *sixty* foot high. However, *clear* *Water* is preferable before the *dirty* *Water* in the *Work* of mine *Engine*.

Miner. But dear Sir, if 60, 70 or 80 foot be the *Determinate Height* for Raising of *Water* by your *Engine*, How shall we Use your *Engine* in a *Mine* or *Pit*, that requires *water* to be raised three times 80 foot, as you know some of our Works do.

Author. I heartly thank you Sir, for this last Proposal, because I have now an Opportunity to acquaint you, That the *Force* used in my *Engine* is in a manner *Infinite* and unlimited, and will *Raise* your *Water* 500 or 1000 foot high, were any Pit so deep; and that you could *find us* a way to procure *Strength* enough to *Support* such an Immense *Weight*, as a Pillar of *Water* a thousand foot high must certainly produce. However, to give you an *Answer*, I must intreat you to give my *Engine* as kind Entertainment and *fair Quarter*, as you do to your *Engines* now in *Use*: For I am sure you are not ignorant of a Custom used in very *deep Mines*, (in several parts of *England*) of Raising their *Water* by several Lifts, from *Cistern* to *Cistern*, to a very great Height; although some of their *Lifts* may not be above *twelve, sixteen, or twenty* foot a Lift at the most. And suppose that your *Engine* now in *Use* at *twenty* foot the Lift, and my *Engine* at *sixty, seventy, or eighty* foot, for at any of these *Lifts* we Raise a *full bore of Water* with much ease. Then one *Lift* of my *Engine* at *sixty* foot, answers to three *Lifts* of your *Engines* at *twenty* foot, and also to *four* of your *Lifts* at *eighty* foot, &c. which you may please to take for a sufficient *Answer* to your last *Objection*. I have known in *Cornwall* a Work with three *Lifts*, of about *eighteen* foot each Lift, and carrying a $3\frac{1}{2}$ Inch-bore, that cost *forty-two shillings per diem*, reckoning *twenty-four* hours the day, for Labour, besides Ware and Tare of *Engines*; each Pump having *four* Men working *eight* hours at *fourteen pence* a Man, and the *Men* obliged to *Rest* at least $\frac{1}{3}$ part of that time.

Miner. You have Sir, hitherto *given* me undeniable *Answers* to my former *Objections*, for which I thank you; but I fancy I shall puzzle you, when I ask you how you will Manage your *Engine* to draw up our *Water*? where the *Shafts* are not *Direct*, but *turn* and *wind* to and fro.

Author. Sir, This last Question is so far from being any hardship put upon my *Engine*, that no *Engine* ever yet invented was so naturally adapted to Work in these crooked Shafts, as mine is: For let the *Windings* or Turnings of the *Shafts* be what they will, the perpendicular weight of *Water* is all that my *Engine* has to account for, and is the same as if it made the Figure of a *Distillers Worm*, and went through the straightest pipe imaginable, except a little inconsiderable *Friction* of the *Water* against the side of the *Pipe* that is crooked, more than is in the straight *Pipe*; which is so small a matter, that a very nice *Judge* would hardly be able to distinguish, whether the crooked or straight *Pipe* carried off most *water* in the working. For the *Flew* that carries the *Smoak*, Experience sufficiently instructs you, that you may turn and wind it any way you please, and that such windings in their *Drawing* most *Air*, do rather improve than prejudice your *Flew*, as any one experienced in Building of *Furnaces*, can inform you.

Miner. Well Sir, I find that our crooked Shafts will not any way incommode your *Engine*: But what think you of Accommodating your *Engine* to the Service of the *Lead-Mines*, whose *Shafts* are many times so narrow, that it will be very difficult to get your *Engine* down.

Author. I perceive Sir, you are yet much a Stranger to the Nature of my *Engine*, which is so furnished with Brass *Skrews*, and as strong as the very Metal it self, that you may take it to pieces, and with ease put it together again, fit to work in a few hours time; and so contrived, that where a *Man* can well go down, there I can put down my *Engine*, in several pieces, and fix them below; for the greatest *Boyle* belonging to my *Engine*, is between twenty four and thirty Inches Diameter, and may, if occasion require, be made yet much narrower and deeper. And that if it be difficult to bring the *Shaft* of the *Mine* to fit my *Engine*, I can with much ease make my *Engine* to fit the *Shaft* of any *Mine*.

Miner. But will not these Brass *Valves* that you speak of in your *Engine*, speedily ware out and stop your Work?

Author. No: They cannot fail me; because Experience shews us, That Brass *Valves* improve, rather then grow

worse, by *twenty* or *thirty* years Use in any *Force-work*, where constantly worked, and where they *Rise* and *Fall* twenty times *oftener* than my Valves will do.

Miner. But what think you, Sir, if you should meet with such *Corrosive Water* in some of our *Mines*, as will in a little time *eat* through your *Copper Vessels*.

Author. Truly Sir, this Question does a little startle me, because I never expected to meet any *Water* of such a *Corrosive* quality in any *Mine*: And could I find out a *Mine*, whose *water* abounds with such *Acid Particles*, as to Destroy or Injure the *Copper Vessels* of my *Engine*, I would *Drain* that *Mine* for nothing but the *water* I shall *take up*; because the *water* would be more *valuable* than any *Oar* (I believe) in *England*. And were there even a *tenth part* of *Aqua Fortis* to *nine Tenths* of *Common water*, which is impossible to suppose it should be; I say, such a *water* could have no Effect on the *Coppers*, were that *water* to lodge some time in the *Copper Vessels*, much less in passing through *them* with that *Celerity* and *Rapid motion* that always acpanies (*sic*) it.

Miner. But Sir, will not such a *Continual Fire*, as must be kept under your *Boylers*, *burn* them out in *two* or *thre* Months time, and *spoil* the *Work* of your *Engine*.

Author. I can assure you they will not *Decay* in some *years*, (unless some *Fellow* be hired or employed on purpose to do it. And should any *Villain* be employed to *burn*, *break*, or *Destroy* any of the *Engines* now used in your *Works* for *Raising* of *Water*, we are then on the same *Level* with you in that point. But I will give you one *Reason* why my *Engines* will not easily *Decay*, and I am sure that will go further with you than all the *Affirmation* I can make. For first of all, Although a *white Heat* will *melt* *Copper*, and a *red Heat*, and sudden *cooling* it again, will *Scale* the *Copper*, yet such a *Heat* as is possible for it to have or suffer while *Water* is in the *Boyle*r, can have no ill *Effect*, or cause any *Alteration* in our *Copper*. A *Friend* of mine has *Coppers* used in *Sugar Boiling* of *twenty* years standing. They may be a small matter *worn* with *cleaning* on the *Inside*, whereas on the *Outside* there does not appear the *least visible Decay*: For as soon as the *Fire* has thrown a thin *Coat* of *Soot* on

the Outside of the *Boylor*, the *Flame* has no other Effect on it, than to cause the *Water* in it to Boyl.

Miner. But we have often Combustable *Vapours* in our Mines, which taking *Fire* from the *Candles* used there, do by a sudden *Explosion* Destroy both the *Mine*, and the *Miner*; and therefore I am afraid that the *Fire* used in your *Engine* will be very *Dangerous*, and apt to *Kindle* those Combustables more than our *Candles*.

Author. To Answer this *Objection*, I will desire leave to give you my Notion of those *Combustables*, which, in short is this: That when your *Miners* come into a close Place, where there is no *Circulation* of Air to carry off the *Efluvia*, or Atoms constantly Rising like *fine Dust* in a *Powder-Mill*. they by knocking and *working* do Increase to be very numerous, like to those *loose Particles* in a *Powder-Mill*. But it is the *work* of some *time*, for those *Vapours* to come to *Perfection*; for I have heard several Experienced *Miners* say, That it is common to avoid the *Danger* of those *Vapours*, by Retiring as soon as they see the *Flame* of their *Candles* burn longer than ordinary; which may be discerned some times long before the *Air* is *thick* enough of this Combustable *Matter*, to take *Fire* at once, and like *Gun-powder* to *Destroy* all. I did hear one say, That from an *Inch and half*, once the *Flame* of his *Candle* did gradually increase to *two foot* long, and yet he escaped. Which makes it very plain, That *Stagnation* of Air is the sole *Cause* of this Inconvenience in *Mines*, which may be totally prevented by a *Pipe* going from the *Ash-Pit* of our *Furnace*, to any part of the *Mine* liable to *Stagnation*. For the *Air* will press, with great *Violence*, through the *Pipe* into the *Fire*, before the Combustable *Matter* can be ready to do any *Hurt*, and *Passing* through the *Fire*, make way for *fresh Air* to Descend in the Room of it. So that our *Fire*, instead of blowing up of your Works, is the best *Means* that can be used to prevent so *Fatal* an Accident; and will likewise carry off all *unwholesom Vapours*, *Damps*, or *Steams* which may proceed from Corruption of Air, by *Stagnations*, or *Vapours* arising from any Poysonous Earth, or *Mineral*.

Miner This Notion of yours carries Reason and Demonstration along with it, which pleases me wonderfully. But Sir, Is not your Price too great for these *Engines* of yours?

Author. By what I shall offer to you, as to my price, I am sure to have you a *Friend* to me and my *Engine* for ever. For I must tell you, that I would never have sent my *Engine* into the World, if it would not raise your *Water* with more *Ease* and Conveniency to you and your Servants, and also much *Cheaper* than any other *Engine* ever used in your *Works*, without which I could never propose any *Advantage* to my self by it. And to Convince you of the Truth of my *Assertion*, I dare undertake the *Engine* shall Raise you as much *Water* for *Eight* pence, as will cost you a *shilling* to Raise the like with your *Old Engines* in Coal-Pits. By this one Article the *Miner* will save one *third* part of his former *Charge*, which is Thirty three pounds six shillings and eight pence saved out of every Hundred pound. A brave *Estate* gained in one Year out of such *Great Works*, where *Three*, *Six*, or it may be *Eight* thousand pounds *per Annum* is Expended for clearing their *Mines* of *Water* only, besides the Charge and Repair of *Gins*, *Engines*, *Horses*, &c. I hope you will not now Account my *Engines* dear under such Conditions as I now offer; But if I should with you suppose my *Engine* proportionable *Dear*, or as *Dear* as the *Engines* you now Use for *Drawing* up your *Water*, which is impossible, my *Engine* will be preferrable before yours in many respects, insomuch as mine prevents your *Damps* and the Evil Effect of them: And as it will be my Interest to allow those that first set my *Engine* at Work considerable *Advantages*; so I hope I may assure my self of due Encouragement from the Ingenious, who are ever studious to promote all Inventions useful and beneficial to the Publick; for they must conclude, that an *Engine* which for some time has daily employed the best Artificers to work on it, was not to be brought forth in one day: And to bring it to that Perfection you now find it, must have cost me and my Friends, not a little Money, to make the Workmen capable of their Work with that Certainty and Exactness they now do. And for Working the *Engine*, any *Person* may have

his Servant taught it, it being to be learnt in a very short time by one of an Ordinary Capacity.

Miner. But there are People who pretend to do great things in the Improvement of *Engines* to work by *Hand* or *Horses*, the Hope and Expectation of which has hindred some of Us in our Work, and tired others, so as to make them out of love with all *Engines*, and almost with the Trade of Mining. And though I wish the contrary, I fear this may prove some hinderance to the promoting your Interest.

Author. True, Sir, I own that Time out of Mind there have been Mountebanks, and *Impostors* in all Faculties, who *pretend* to *Great* things, but do *perform* Nothing effectually. And it would be hard if that should be drawn into Consequence, That because some are Knaves, therefore none are Honest. I know the Notions of the *Perpetual Motion*, or Self-moving Engine, and many such like Whims are *pretended* to by *Designing Men*, and believed by Ignorant Ones: But the Judicious Man, who considers the *Laws of Motion*, knows it is an Infallible Rule, That whatsoever *Matter* is to be *removed upward*, must have a *Force* superiour to the *weight* to be *lifted* up. If its *Motion* be required as *swift* as the *Motion* of the *Moving Cause*; if *slower*, proportionably *less* strength will do; if *swifter*, then the *Moving Cause*, as Mens Hands, Horses, or Dead Weight, then must the Strength of the *Moving Cause* be Increased proportionably, or no *Motion* can be produced. And the Experience of Ages shows us this, to be a most *sure Rule*, allowing for *Friction*, which is *larger*, the more *Wheels* or *Parts* an *Engine* consisteth of; and of Consequence, the *fewer* *Parts* or *Wheels* an *Engine* consisteth of, the easier it Works: So that by barely looking on a *Pump*, if it has more *Parts* or *Wheels* then the Common *Crank-work*, you may conclude it worse; if a *Chain-work* or *Tub-work* the same. So that all that can be *Expected*, is to make those *go Easier* then they are *now* made to go by Ingenious Workmen, expert in making them. And if you try how *small* a *Matter* will *more* those *Engines*, when not *Loaded* with *Water*, you will find the *Friction* so small, as not worth any *mending*, could it be done, especially the *Tub-Gin*, whose *Friction*

increases the least in being Loaded of any; but the others are vastly encreased by the *Leathers* of their *Suckers* being forced broader, and *Rubbing* with much greater *Force* against the *Barrel* they work in, according to the Height the Pipes are raised.

And I hope, when it is considered how far this *Engine* of *Mine* differs from the bare *Pretensions* of Ignorant or *Designing* Men; and that any Persons may see what my *Engine* will perform, before they Contract for it; there will be found no Ground for the least Suspicion in any Person concerned to Employ them in *Mines*: But to the contrary, afford us a Generous Incouragement, in a Business so condusive to the Increasing the Mining Trade, and thereby Inrich themselves and the Nation, and Increase the King's Revenue.

I could heartily wish all *Miners*, for their own as well as their Countries Interest, were good *Mechanicks*, and truly understood the *Nature*, Use, and Application of all *kinds* of *Engines*; for I am sure those that do, will be my best Friends, without Expecting that *Horses* or *Men*, or any other *Strength* can or will do more then what *Nature* and the *Laws of Motion* has allow'd them.

THE END.

THE WILL OF THOMAS SAVERY.

“In the name of God, Amen. I, Thomas Savery, of the Parish of St. Margaret’s, Westminster, in the County of Middlesex, Esquire, being at present sick and weake in body but of sound and disposing mind and memory, thanks be to God for the same, doe make and ordain this my last Will and Testament in manner and forme following, hereby revoking and annulling all former Will and Wills by me at any time heretofore made—that is to say—I doe give, devise, and bequeath unto my loving wife, Martha Savery, all my goods, chattels, debts, money, real and personal estate whatsoever, and wheresoever, and all my estate, termes, and interest of and in any invention or inventions by virtue of any letters patents under the Great Seal or by Act of Parliament or otherwise howsoever, and I do make, ordain, constitute and appoint my said loving wife, Martha Savery, full and sole executrix of this my will. In witness whereof I have to this my will, conteyned in this side of paper, sett my hand this 15th day of May, in the year of our Lord, 1715.”

The witnesses are Catherine Alexander, Walter Davis, and John Meres, but, so far as we are aware, they are unknown to history. The will was proved by the widow on the 19th of May, so that Savery must have died shortly after executing it, but she seems never to have administered the estate, and accordingly letters of administration, with the will annexed, were granted on the 10th of June, 1796, to Thomas Ladds, who was the executor of one Charles Cæsar, a creditor of Savery’s. Seeing that so many years elapsed before the estate was wound up, it is probable that Savery’s papers survived destruction until the beginning of the last century, and perhaps later. His death was not noticed in the newspapers of the day, and the place of his burial is not known. He would naturally have been interred at St. Margaret’s, Westminster, but the register does not contain any entry referring to him.

ANNUAL EXCURSION.

The annual excursion of the Royal Institution of Cornwall took place on Tuesday, 23rd August, 1904, and proved a great success in every way. It was more numerously attended than last year's excursion, and two large brakes were requisitioned for the trip. The trip was *via* King Harry Ferry to Philleigh, thence to Gerrans, Trewince, and down the narrow strip of land overlooking St. Mawes and Falmouth towards St. Anthony-in-Roseland. At Trewince the party were entertained by Mr. and Mrs. J. Collette Thomas. The weather of Monday was so wet, cold, and dull that Tuesday's prospects were far from inviting; but early on Tuesday morning a slight northerly breeze and a rising barometer gave promise of fine weather, which fortunately held good. The company included Mr. and Mrs. J. C. Thomas, Mr. A. L. Thomas, Miss Olive Thomas, rev. S. Rundle (Godolphin), rev. W. Fookes and Mrs. Fookes (Philleigh), rev. H. J. Martin (Gerrans), rev. W. E. Graves and Mr. G. Graves (St. Clements), Professor C. Müller (Bombay), Dr. W. Hammond (Liskeard), Dr. and Mrs. Charles (Flushing), Mr. J. D. Enys, Mr. and Mrs. W. Ward (Bosloe), Mr. J. R. Collins (Bodmin), Mr. W. H. Paterson (London), Mr. J. H. Collins, F.G.S., Miss Helen Collins and Miss Gwendoline Collins (Crinnis), Mr. R. H. Williams, C.E., and Miss Williams (Cuddra), Mr. H. H. Share and Miss Share, Mr. W. J. Clyma, Mr. Hamilton James and Miss James, Mr. C. E. Tregoning, Mr. F. A. Cozens, Mr. R. Michell, Mr. R. H. K. Michell and Miss Michell (Truro), Mr. K. Ball (Woolwich), Mr. E. M. Milford, Mr. S. Jones and Miss Jones, Mr. A. P. Jenkin and Miss Jenkin, Mr. and Mrs. A. H. Jenkin (Redruth), Mrs. Ratcliff-Gaylard, Miss James, Miss Martyn, Miss L. Paull, and Miss Henderson (Truro), rev. W. Iago, B.A., and Major Parkyn, F.G.S. (hon. secs.), and Mr. George Penrose (curator).

King Harry passage across the Fal was reached at 11 a.m. The meaning of the name "King Harry" has not been explained. It is locally attributed to an unhistorical visit of Henry VIII, who is alleged to have crossed here on his way to the castles of Pendennis and St. Mawes. Philleigh Church, on the south side

of the water, was the first place of halt. This parish was known formerly as Eglosros and S. Fili de Eglosros, a name that in the form of Eglewys Ros occurs also in the diocese of St. Asaph. The name is said to mean "the church on the heath." The peninsula of which this is the head is known as Rosland, now corrupted into Roseland. In this parish is Tolvern, formerly a seat of the Arundels, and before them of the Soors. Ralph Soor and his wife had licence for a chapel here, 2 July, 1372. Who S. Filius was is not easy to say. Mr. Borlase (Age of the Saints, p. 133) thought he was identical with St. Teilo, a friend of Budoc and Samson, who with many doctors and bishops arrived at the harbour of Dingerein, only to find King Gerennius at the point of death. But the identification appears a little forced. The history of the rectory is not very eventful, but it is perhaps worth noting that in 1321 occurs one of those instances of the bishops having the power to partially undo the mischief done by lay patrons, and not hesitating to exercise the power. Sir John de Resueydon, priest, having been instituted on the presentation of Joan, relict of Sir Roger de Carmynon, knight, the bishop, finding that he was not sufficiently educated to discharge the duties of his cure, insisted on his having a properly qualified assistant, on pain of forfeiting his own benefice. The 15th century church was mainly re-built in 1867, and in a spirit far from conservative. The tower was, by different members of the institution, declared to be Early Norman, and 13th century. The writer of these notes places it later, namely in the 14th century, though the foundations are probably earlier. There is within a copy of Charles I's celebrated letter from Sudeley, in 1648, such as is to be found in several Cornish churches, except that here an early copy has been sold, and a modern one put in its place. Such greed and ignorance are beyond forgiveness. Most of the monuments have been removed from the building, and placed no one knows where. The restoration and decoration of the chancel appear to have been carried out by the village carpenter, and are very inferior.

Dingerein Castle was next visited. Mr. J. Collette Thomas gave a description of it. The fortress stands on the southern side of a little eminence overlooking Gerrans Bay. The whole is nearly circular, about an acre in area; it is fairly level. At the northern

end of the bank is the entrance into it. A broad fosse opens up, carrying a rampart on each side still showing the remains of a cross rampart, which once united with gates to secure this only avenue to the castle. The fosse appears to have been excavated with great labour, and the earth thrown upon the area within. The rampart is nine or ten feet in height; the part on the right a regular bank of earth, perpendicular without, yet sloping within, carrying two or three eminences in its line that look like so many turrets of earth, and are supposed by the neighbours to be stations for sentinels. Whitaker (*Hist. of Ancient Cathedrals of Cornwall*, vol. 2, p. 292—a book full of learning and perverse ingenuity) has given an account of a remarkable subterraneous passage extending from the castle to the sea, the opening of which on the side of the hill-cliff was visible at the time he visited the neighbourhood, and was commonly called the Mermaid's Hole, the mouth of which is large enough to admit a man walking erect. It has been pursued by some of a more daring spirit for 40 or 50 yards up into the land. At that distance, by reason of the falling in of the roof, it contracts very much. Dr. Winn, in 1844, expressed the hope that some day the funds of this Institution would permit of thoroughly exploring the castle and the neighbouring barrow where Gerennius was reported to have been buried in great state. Tradition talks of a boat being buried in the barrow at the same time as the body of the king, a boat with oars of silver and sides of gold. In 1855 the cairn was opened by a local clergyman to satisfy the curiosity of the natives. It was unfortunate, as no scientific account was preserved of what was found. Everyone thinks he can open a cairn, whereas it should only be done by experts. No precious metal was found, but a kist vaen, formed of unhewn rocky masses lying north and south, measuring internally four and a half feet in length, two in breadth, and two and a half in depth. The sides were smooth rocks placed on edge upon the soil. The huge covering block of limestone was nearly two feet thick. Within were charcoal and ashes—perhaps those of the king, but probably not (See 37 Report R.I.C., 1855, p. 23).

For information respecting the beautiful cinerary urn found at Merrows farm near Dingerein, and now deposited in the museum of this Institution, see 26 Report R.I.C., 1844, p. 19.

The name of Gerennius is preserved in St. Gerrans Church.

On arriving at St. Gerrans Church, the party were shown over the interior by the rector (the rev. H. J. Martin). The church, that was almost wholly rebuilt in 1848, is dedicated to St. Geraint, Gerendus, or Gerennius, a saint of whom as little is known as of S. Filius. The local press in their reports of the excursion called him "the canonised king." He may have been a king, but we are unaware that he was ever canonised. In 1334 it was a chapel dependent on St. Anthony, and was confirmed to the priory of St. Peter and St. Paul at Plympton by John de Grandisson, bishop of Exeter. It was, however, parochial and not a mere chapel of ease, and is referred to in records as a rectory as early as 1260. In 1202 Bp. Marshall had allotted a moiety of the tithes to the convent of Plympton, but reserved the patronage to the bishop of Exeter. The building comprises a chancel, nave, south aisle, north transept, and vestry. The chancel is separated from the other parts of the church by a good modern screen of oak. In the aisle is the handsome marble monument of Edward Hobbs (ob. 1718) and his wife. The arcade has seven four-centred arches of granite, supported on monolith pillars of the same material. The roofs are of open woodwork. In the north wall of the transept is an arched recess, in which is deposited a well-preserved priest's tomb, removed hither from the chancel. There is a south porch, in which are the remains of a stoup, a north door, and a vestry or priest's door blocked. The tower, which is of two stages, is buttressed at the angles and battlemented. It is surmounted with a spire, on one panel of which is carved the date "January 25th, 1636." The church was practically rebuilt in 1849-50, and the spire restored in 1890. The rector kindly showed the parish register, dating from 1538. One entry refers to the Act of Parliament, passed 24th August, 1653, disallowing marriages solemnised by a minister, and substituting the justice of the peace. As a result, no marriages were solemnised in the parish for three years. Then the law was repealed, and the then incumbent of the parish records how he solemnised the ceremonies which had been delayed for three years. References to these events are not infrequent in registers. The present rector remarked that the church was the

head quarters of the first bishop of Cornwall Kenstec, who held office in the 9th century, but this is a misapprehension. Dr. Scrivener, whose entries in the parish register were pointed out, was rector of Gerrans from 1862 to 1876. He was an eminent scholar, and was one of the revisers of the English version of the bible.

THE LUNCHEON.

At Trewince, the charming 18th century residence of Mr. and Mrs. Thomas, the party sat down to lunch in a tent on the grounds. Mr. J. Collette Thomas presided, being supported by Mrs. Thomas, rev. W. and Mrs. Fookes, rev. H. J. Martin, Dr. and Mrs. Charles, Mr. A. L. Thomas and Miss Olive Thomas.

Mr. J. D. Enys proposed, and Mr. W. W. Ward seconded a vote of thanks to the host and hostess.—Rev. W. Iago supported.

The vote of thanks was enthusiastically received.

Mr. Thomas, in response, made a most interesting speech, combining flashes of wit with more serious dissertation on the features of that part of the country. He wished to say, on behalf of his wife and family, that they welcomed all there that day with more pleasure than they could possibly express. They had looked forward with great interest and pleasure to the coming of that learned and honourable society into that somewhat remote neighbourhood. He urged on his hearers the necessity for more careful study of antiquity and history, and incidentally expressed a hope for greater care in the preservation of the monuments in our churches and churchyards.

Mr. W. H. Paterson (London) a native of Cornwall, and Mr. J. R. Collins (Bodmin) also said a few words.

The party then made a tour of the picturesque grounds, and walked through the woods, whence a magnificent view of Pendennis Castle and the Castle Drive, Falmouth, was obtained. Tea was served about 4.50 p.m., and a start made for home twenty minutes later. The roads being in capital condition, the party arrived at Truro railway station in time for visitors to catch the 7.45 p.m. up train.

Royal Institution of Cornwall.

86TH ANNUAL MEETING, 1904.

The Annual General Meeting of the Royal Institution of Cornwall was held in the library of the Institution at Truro on Tuesday afternoon, the 22nd November, 1904. The president (Sir Edwin Durning-Lawrence, Bart., M.P.), occupied the chair, and the attendance, which was large, included Sir John Alleyne, the ven. archdeacon of Cornwall, the rev. S. Rundle, H. H. Mills, W. E. Graves, D. G. Whitley, S. H. Farwell Roe, Dr. Clark, Dr. Vigurs, Dr. E. Sharp, the mayor of Truro (Mr. W. F. Clarke), Messrs. J. D. Enys, F.G.S., J. H. Collins, F.G.S., Thurstan C. Peter, H. James, W. A. Rollason, R. V. Tellam, F. H. Davey, F.L.S., R. Vallentin, F.L.S., J. J. Smith, W. N. Carne, A. Blenkinsop, S. Jones, W. Tresidder, F. W. Osborne, W. J. Clyma, F. Pearce, W. J. Mock, F. R. Pascoe, A. B. Coomb, J. Morrish, G. Dixon, J. P. Paull, R. Mitchell, E. Kitto, F.R. Met. Soc., W. Barratt, and P. Jennings, Lady Durning-Lawrence, Mesdames Iago, Wallis, Graves, Dixon, and J. P. Paull, Misses Alleyne, H. Collins, Jones, Tomm, James, De La Fosse, Rowe, Henderson, Share, Paull, E. Reynolds, and Cornish, the rev. W. Iago, B.A., and Major Parkyn, F.G.S. (hon. secretaries), and Mr. George Penrose (curator).

The president announced that letters of apology regretting inability to be present had been received from the earl of Mount Edgecumbe, the rev. Sir Vyell Vyvyan, Canon Flint, the rev. Thomas Taylor, Capt. Rogers, R.A., Dr. Hammond, Messrs. A. P. Nix, J. C. Daubuz, G. H. Chilcott, and Howard Fox, F.G.S.

The minutes of the last meeting, 17th May, were read and confirmed.

The rev. W. Iago presented for the Council the 86th annual report:—

86TH ANNUAL REPORT

The Council of the Royal Institution of Cornwall have pleasure in presenting their 86th annual report, and to be able to announce the continued prosperity of the society. Founded in 1818 by such well known men as Vivian, Enys, Daniell, Tweedy, Dr. Taunton, Dr. Potts, and many others, it is pleasing to know that the descendants of some of these gentlemen are living and still associated with our society. One of the most honoured amongst them we are delighted to see with us to-day at this meeting: our good friend Mr. J. D. Enys. It was a Mr. Francis Enys who presided at the second meeting held for the formation of this institution, on the 2nd March, 1818. There was a reference at that meeting to a letter of a complimentary nature having been received from Dr. Forbes, secretary to the Geological Society of London, which showed that the efforts being made at that time to found this society were duly recognised and appreciated in the scientific world.

We have unfortunately to regret the loss by death of six of our members: Canon A. P. Moor, Canon Aug. B. Donaldson, Sir Clement Le Neve Foster, Mr. T. King, C.B., Mr. H. Barrett, and Mr. T. Worth.

Canon Allen Page Moor was born at Woodbridge, in Suffolk, and was educated at Yarmouth and Norwich, and afterwards proceeded to Trinity College, Cambridge. On leaving the latter place Mr. Moor became connected with the Missionary College of St. Augustine at Canterbury, of which he was appointed the first fellow. He resigned his appointment there as sub-warden in 1866. In 1872 he was appointed by the lord chancellor to the living of St. Clement's, which he held for a period of 28 years. By the death of Canon Moor the institution has suffered a severe loss. His membership dates from the time when he came into the county, and he at once took an active and prominent part in its proceedings, and was most constant in his attendance at our meetings. He rendered valuable service, and by his influence induced many of his friends to become subscribers.

Sir Clement Le Neve Foster was born at Camberwell in 1841. After receiving a scientific education at the Royal School of Mines, London, and at the Mining College, Freiburg, he was

appointed in 1860 to the Geological Survey of Great Britain: his special work being on the Wealdon Beds of Kent and Sussex, and subsequently in Derbyshire and Yorkshire. In 1865 he took the degree of D.Sc. of London, and was afterwards appointed lecturer to the Miners' Association of Cornwall and Devon, and in this capacity interested himself in the question of introducing improved appliances into the mines. Two years later he gave up this appointment in order to undertake mining explorations abroad. On the passing of the Metalliferous Mines Regulation Act of 1872 he was appointed one of the inspectors, and was stationed in the Devon and Cornwall district. It was at this time that he took up his residence at Truro, and became one of the secretaries of this institution. Dr. Le Neve Foster contributed several papers to the journal, and in many ways did good work for the society. In 1890 he succeeded Sir Warrington Smyth as professor of mining at the Royal School of Mines, and in 1892 the Royal Society elected him a fellow. Last year he received in recognition of his great public services the honour of knighthood.

Canon Augustus Blair Donaldson joined the society soon after he came to Truro some 20 years ago, and always took a lively interest in its work. He frequently attended our meetings, and took part in the various discussions. Canon Donaldson was well known throughout the county, and was the first precentor of Truro cathedral. His death is a great loss to Truro and the diocese.

Mr. Thomas King, C.B., H.M. Inspector of Schools, was a valued servant of the Crown, and rose to the position of chief inspector of schools. He was a member of an old Cornish family, and brother to the late Mr. F. King, surgeon, of Truro, whose lamented death was noticed at our meeting last year. Mr. King had a distinguished collegiate career, and was a fellow of Jesus College, Cambridge.

Mr. Henry Barrett was a member of some years' standing, a constant attendant at the meetings, and a familiar figure at the annual excursions.

Mr. T. Worth was an old and respected inhabitant of Truro, and one who did a great deal of work for the city and county

generally. He was for many years a member of the institution, and was always ready to do whatever he could to further its interests.

A large number of valuable gifts has been made to the museum during the past year. The following should be specially mentioned:

Lady Durning-Lawrence has presented a beautiful series of polished agates, precious opals, and other beautiful minerals, and a choice collection of recent shells and echini, which include many of the rarer species. Selected specimens have been placed temporarily in one of the cases in the museum, and it is hoped that it will shortly be possible to work them into the general collection.

In the early part of the year two cinerary urns were discovered in the county, one at Treworrick Farm, St. Ewe, the property of the earl of Mount Edgcumbe, and the other at Tresawen Farm, Merther, the property of Gen. the right hon. Viscount Falmouth. It affords us very great pleasure to be able to state that both the earl of Mount Edgcumbe and Lord Falmouth have been pleased to allow the respective urns to be deposited in the museum.

Mrs. Chamberlin, who has on several occasions presented valuable objects, has again shown her interest in the museum by sending a beautiful carved marble panel taken from an Italian church representing the archangel Michael weighing the souls of the saints; also an Arab chief's embroidered cloak.

The Committee and Patrons of the Beni-Hasan Excavations have presented a series of 32 examples of Egyptian pottery, typical work of the xi-xii dynasties (date about 2,300 B.C.), from the excavations at Beni-Hasan directed by Mr. John Garstang, B. Litt, Reader of Egyptian Archæology, University of Liverpool.

Another collection of pottery (Egyptian and Roman), including vases, lamps, terra cotta figures, together with other antiquities, has been presented by the President and Committee of the Egyptian Exploration Fund. Thanks are due to Professor Flinders Petrie for laying our application before the committee, and materially assisting to get these interesting objects for the museum.

To Mr. J. D. Enys we are again indebted for many excellent specimens, including portions of the skeleton of the Moa, a bird now extinct, some pottery, and a tinder box with striker and flint.

Mr. W. T. Pope has sent a well mounted crocodile which was captured by him in South Africa.

The additions to the library have also been numerous and valuable. The most important donation has come from Mr. J. D. Enys. Amongst other books he has presented an almost complete set of the works of Darwin and several volumes of reports on the scientific results of the exploring voyage of H.M.S. "Challenger," 1873-1876.

During the year 5,671 persons visited the museum. This number is again an increase on former years.

Admitted free	...	...	...	4,283
Members and friends	...	...	...	1,039
Admitted by payment	...	...	...	349
				5,671

Several eminent mineralogists have come specially to examine the minerals. In particular may be mentioned Professor H. A. Miers, D.Sc., M.A., F.R.S. (Waynflete Professor of Mineralogy, Magdalen College, Oxford), who was accompanied by some of his students, and Mr. L. J. Spencer, M.A., of the British Museum. All expressed themselves greatly surprised at seeing such valuable collections. Prof. Miers, since his visit, has sent the following letters to our curator:—

"Magdalen College,

"Oxford, Jan. 7, 1904.

"Dear Mr. Penrose,—

"I cannot tell you how I enjoyed the day spent with you and Mr. Enys over the Rashleigh Minerals. Before seeing them I had no idea that the collection was such a fine one, or that the foreign localities, as well as the British, were so well represented.

"When the collection is set out it will be found to be as fine an exhibit as any in England, with the exception of the British Museum and Jermyn St. collections.

“I was particularly glad to see that these magnificent specimens are to be well preserved and exhibited in show cases worthy of them. I think this is most important. Too many collections are inadequately housed, and imperfectly protected from dust. I am very glad to see that your Council realise the responsibility which the possession of such a collection brings with it, and I do hope that they will push on with the work which they have begun, and get all the specimens as soon as possible into cases similar to the one which contains the elements. The Collection will then be one of the glories of Cornwall, and the other collections will also for the first time be seen to advantage.

“I think that Mr. Enys, and those who helped him to secure this historic collection for Cornwall, and so prevented it from being broken up, have done a very fine thing.

“Yours truly,
“HENRY A. MIERS.”

“Magdalen College,
“Oxford, Feb. 25, 1904.

“Dear Mr. Penrose,—

“I shall be glad to know what progress you are making in the work of arranging and exhibiting the Rashleigh Collection.

“These specimens, added to those which were previously received from Mr. J. C. Williams, will make the Truro Museum second to none as regards Cornish specimens, and I am sure that the two collections together deserve any time and expense that can be spared for them.

“Yours sincerely,
“HENRY A. MIERS.”

It was pointed out in the last annual report that in order to properly display the mineral collection fourteen new cases were necessary and the hope was expressed that it might be possible with the help of friends to provide such cases. Mr. J. D. Enys kindly offered to give a case, which has since been received and placed in the museum, and now contains the group of minerals allotted for it.

Sir John Langdon Bonython, of Adelaide, South Australia, one of our vice-presidents, has, through Mr. Enys, ordered a similar case to be made and this one is expected to be delivered in a few days. The council very much appreciate this kindness on the part of Mr. Enys and Sir J. Langdon Bonython.

It will be seen that there are still many more cases required to complete the series, and the Council would be very glad to receive offers of help in order that this good work may be completed.

Several improvements have been made in the museum during the year, but until more cases are available the general re-arrangement of the collections must necessarily be slow.

The library having grown to such an extent, it became necessary in the early part of the year to provide additional shelf accommodation. After this was done the whole of the books were carefully gone through, rearranged and properly classified.

The journal (No. 50) issued a few months ago contained many interesting and instructive papers. A new feature in this number was the inclusion of the portrait of our late president, Sir Robert Harvey. The institution is indebted to him for supplying the necessary number of plates and also for bearing the greater portion of the cost of printing his address. Several members have expressed the hope that the future volumes of the journal will contain as a frontispiece the portrait of the president for the time being, and as far as possible this will be done.

The excursion this year to Gerrans was one of the most successful in the annals of the society. Between 50 and 60 members, and their friends took part, and after examining the various places of interest in the neighbourhood they were most hospitably entertained by one of our members, Mr. J. Collette Thomas, at his beautiful residence, Trewince. The council desire to place on record their indebtedness to Mr. Thomas for the admirable manner in which he catered for the enjoyment of the party. A full account of the excursion will be printed in the journal.

Before closing the report the council desire to mention that they would be glad if members would make a special effort to induce others to join the institution and thus help to increase its

usefulness. With more help more can be done and it is felt that there must be many in the county who would become members if they were approached.

The president has one more year to serve and the council recommend that the other gentlemen mentioned in the following list be appointed to the respective offices for the ensuing year:—

President :

Sir EDWIN DURNING-LAWRENCE, Bart., M.P.

Vice-Presidents :

Mr. JOHN D. ENYS, F.G.S.	|	Sir J. LANGDON BONYTHON.
The Rt. Hon. L. H. COURTNEY.	|	Mr. J. C. WILLIAMS.
Rev. S. BARING-GOULD.	|	Sir ROBERT HARVEY.

Treasurer :

Mr. A. P. NIX.

Secretaries :

Major PARKYN, F.G.S., and Rev. W. IAGO, B.A.

Other Members of the Council :

Ven. Archdeacon CORNISH, M.A.	|	Mr. THURSTAN C. PETER.
Mr. HOWARD FOX, F.G.S.	|	Rev. S. RUNDLE, M.A.
Mr. HAMILTON JAMES.	|	Mr. JAMES OSBORNE, F.G.S.
Rev. D. G. WHITLEY,	|	Professor J. CLARK, D.Sc., M.A.
Chancellor PAUL, M.A.	|	Rev. H. H. MILLS.

Joint Editors of the Journal :

Mr. THURSTAN C. PETER and Major PARKYN, F.G.S.

Mr. J. H. Collins moved the adoption of the report, and proposed a vote of thanks to the officers.

Rev. W. E. Graves seconded, and the motion was carried.

ST. PIRAN'S OLD CHURCH.

The archdeacon of Cornwall referred to the old church of St. Piran at Perranzabuloe, and moved that Mr. Thurstan C. Peter be appointed their representative on the committee selected by the Diocesan Conference to consider the preservation of the church. He said they all felt it was of the greatest importance that a building so insignificant in itself, but so extremely valuable to them in Cornwall, should be properly cared for. At present there was a real danger of the building being again swallowed up by the sands, and if they did not take advantage of the opportunities now being given to them it would lapse into its old sleep. They wanted as far as possible to keep the old church as a memorial of what it really was—the oldest church in Cornwall and very nearly the oldest in the country.

Mr. Enys seconded the proposition, which was unanimously carried.

A RUSSIAN GEOLOGIST.

Rev. D. G. Whitley gave an account of the labours of Baron Toll, the Russian geologist, in the land of Siberia, and what were called the Islands of Siberia. Baron Toll died in the land, and his papers were sent to St. Petersburg. If they could only get them, not only would they receive information upon the greatest wonder of the world, but also marvellous light upon the quarternary period of Cornwall of superficial beds upon their coasts.

Mr. R. Mitchell, a Fellow of the Imperial Russian Geographical Society (now of Truro), said he would endeavour to obtain the information desired.

BOTANICAL REPORT FOR 1904.

Mr. F. H. Davey presented a report on the botanical work done by himself and his coadjutors during the year, which is printed in this journal.

Dr. C. C. Vigers, of Newquay, gave a description of the plant *Fumaria occidentalis*, Pugsley, and handed around specimens for inspection. Dr. Clark also spoke on the subject.

Mr. P. Jennings read a paper on "The Mayoralty of Truro, A.D. 1538—1722," and Dr. Clark referred to a paper in preparation on the "Injurious Insects of Cornwall."

Mr. Thurstan C. Peter had prepared a paper on "St. Ives Church," but there was not time for it to be read.

On the motion of Mr. Thurstan C. Peter, seconded by the archdeacon of Cornwall, the readers of papers and donors of gifts to the museum and library were thanked and a hearty vote of a similar character was accorded the president on the proposal of Mr. J. D. Enys and Sir John Alleyne.

GIFTS AND ADDITIONS TO THE MUSEUM.

DEPARTMENT OF ANTIQUITIES AND ETHNOGRAPHY.

Cinerary urn and the fragments of bone that were found in it, excavated at Treworrick Farm, near St. Ewe, Cornwall, 18/1/1904	} }	The Rt. Hon. Earl of Mount Edgcombe.
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Cinerary urn (in fragments) from Tresawsen Farm, Merther. Also the fragments of bone that were found in the urn and the stones that were placed around it for protective purposes	} Gen. The Rt. Hon. Viscount Falmouth.
Tinder box, striker and flint, from a village near Stratford-on-Avon... ..	
Egyptian Vase brought from Alexandria	} Mr. J. D. Enys, F.G.S.
Impression of Brunel medal, in clay taken from the Thames Tunnel. Pottery found in a cave on one of the Maltese Islands	
Hammer stone discovered by a workman whilst ploughing in a field on Rayle Farm, Illogan, 1904	} Mr. W. J. Fox.
Thirty-two examples of Egyptian pottery, (typical work of the xi-xii dynasties, date about 2,300 B.C. Wooden face from mummy case xxv dynasty, date about 800 B.C. From Mr. John Garstang's excavations at Beni-Hasan, Upper Egypt	} The Committee and Patrons, Beni-Hasan Excavations.
Two elm piles taken out of Penryn Creek	} Mr. R. A. Newcombe.
Embroidered cloak of an Arab chief from the Soudan. Carved marble panel from an Italian church, representing the archangel Michael weighing the souls of the saints.	} Mrs. Chamberlin.
Collection of lamps, terra cotta figures, vases, etc. Roman Period. From Professor Flinders Petrie's excavations at Ehnasya	} The President and Committee Egypt Exploration Fund.
Collection of antiquities, including reed pens, ivory draughtsmen, dice, wood and bone combs, glass beads, bone hairpins, etc. From the excavations of Dr. Grenfell and Dr. Hunt at Oxyrhynchus.	
Collection of vases, xviii dynasty, from Prof. Flinders Petrie's excavations at Sedment	

DEPARTMENT OF ZOOLOGY.

Portion of the skeleton and fragments of the egg shell of the Moa, a bird now extinct, from New Zealand	} Mr. J. D. Enys, F.G.S.
Lower jaws of two Maories, found in a sand hill on North Island, New Zealand	
African crocodile	} Mr. W. T. Pope.
Collection of shells and echini	} Lady Durning-Lawrence.
Common seal (<i>Phoca Vitulina</i>), caught at Perranporth, 21st October, 1904	} Purchased.

DEPARTMENT OF BOTANY.

Piece of beech with inscription cut in the bark, causing changes in the woody part	} Mr. W. Barratt.
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DEPARTMENT OF GEOLOGY.

Wood from submerged forest at Maenporth beach between Falmouth and the Helford River ... }	Mr. W. Barratt.
Miscellaneous collection of rocks and fossils ...	Mr. Tregellas.
Jade from Cornwall }	
Two specimens of gum from Auckland, New Zealand. One specimen in its natural state, the other as prepared for the market }	Mr. J. D. Enys.
Sample of the dust which fell on the deck of the Castle Company's R.M.S. "Roslin Castle" on the evening of February 13th, 1898, in lat. 18 north }	Capt. T. Jenkin.

DEPARTMENT OF MINERALOGY.

Nodules of Marcasite from Isle of Sheppey ...	Mr. W. Tresidder.
Miscellaneous collection of minerals	Mr. Tregellas.
Enysite ? from St. Agnes	Mr. J. D. Enys.
Collection of minerals, including a fine series of polished agates, some excellent calamines, a very good variscite, a small but very select series of opals, chiefly precious opal, a good Greifenstein apatite, and numerous other showy specimens }	Lady Durning- Lawrence.
Crystallized cassiterite from Pedn-an-drea Mine, Redruth }	Mr. J. Hocking.
Native copper from Levant	Capt. T. Jenkin.
Three crystals of ruby spinel and a number of inferior fragments of spinel, from Mogoh, Upper Burma }	Mr. C. S. Rogers.
Typical gold ores from the West Coast of Africa...	Mr. F. W. Osborne.
Four varieties of crystallized calcite, from Levant Mine, Cornwall }	
A large crystal of antimonite from Japan. Dysanalyte (with monticellite and magnetite), from Magnet Cove, Arkansas }	By exchange.
Cyanite (green variety) from Litchfield, Con- necticut. Titanite, from Pontiac Co., Quebec. Clinocllore, from Philadelphia, U.S.A. }	
Specimens of following minerals — wolfram, ferruginous quartz, iron pyrites, cassiterite with pink felspar, cassiterite, malachite }	Mr. J. C. Daubuz.
Fine crystallized specimens of native copper and malachite from America }	Lent by Mr. Thos. Tregaskis.

DEPARTMENT OF MANUSCRIPTS, PRINTS, AND DRAWINGS.

Portrait of himself (President 1903-5) }	Sir E. Durning-Lawrence, Bart., M.P.
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GIFTS TO THE LIBRARY.

Challenger Reports :—

Narrative of the Cruise (2 vols.)
 Botanical Reports (2 vols.)

The following works by C. Darwin:—

Animals and Plants under Domestication (2
 vols.)
 Descent of Man (2 vols.)... ..
 Origin of Species
 Naturalists Voyage around the World... ..
 Cross and Self Fertilisation of Plants
 Insectivorous Plants
 Climbing Plants
 Forms of Flowers
 Coral Reefs... ..
 Fertilization of Orchids
 Vegetable Mould and Earthworms
 Expression of the Emotions
 Monograph of the Cirripedia
 Monograph of the Balaniadae
 Geological Observations on South America
 Life of Erasmus Darwin, by Charles Darwin... ..
 Contributions to the Early History of New
 Zealand

Mr. J. D. Enys.

Reports on Fishery Exhibition, 1883 :—

Handbooks (3 vols.)
 Conference Reports (4 vols.)
 Prize Essays (4 vols.)
 Official Catalogue and Jury Awards
 Analytical Index

Flint Chips. E. T. Stevens
 Rude Stone Monuments. Jas. Fergusson
 Geological Observer. De la Beche
 Fossils of the British Museum. G. A. Mantell
 Testimony of the Rocks. Hugh Miller
 Notes of a Naturalist in South America. John Ball
 A Journey in Brazil. Professor Agassiz
 The Royal Institution, its Founders and its First
 Professors. Dr. Bence Jones
 Origins of English History. E. I. Elton
 Manual of Injurious Insects. E. A. Ormerod
 Proceedings of the Royal Colonial Institute,
 Vol. 35, 1903-4

Geological Magazine for 1893 Mr. Walter Barratt.

Edmonston's Flora of Shetland } Mr. C. F. Argyll
 Saxby, M.A.

Jenner's Handbook of the Cornish Language Mr. T. C. Peter.

Remains of the late Tobias Martin Rev. S. Rundle.

THE MAYORALTY OF TRURO, A.D. 1538—1722.

BY P. JENNINGS.

“Of our more abundant grace we will and for us our heirs and successors by these presents do grant to the Mayor and Burgesses of the Borough aforesaid and their successors, that the same Mayor and Capital Burgesses and Common Council of the same Borough for the time being, or the greater part of them, from time to time, at all future times, may and shall have power and authority annually and every year on the ninth day of October to nominate and assign, and that they may and shall be able to nominate and assign one man then being an Alderman of the same Borough, before the other Aldermen and Capital Burgesses of the same Borough then and there present, as Mayor of the Borough aforesaid for the year next ensuing, which man so elected to the office of Mayor after his corporal oath in due manner made and taken, shall bear the said office of Mayor of the Borough aforesaid for one whole year then next ensuing (to wit) from the aforesaid ninth day of October to the ninth day of October then next following, and from the same day until some other person be elected to the same office, and shall be duly sworn faithfully to execute the said office, and if any one hereafter so elected as Mayor of the Borough aforesaid, to whom the election shall be made known, shall refuse to take upon him the office aforesaid without reasonable cause, that then it shall be lawful for the Mayor of the Borough aforesaid, and Aldermen and other Capital Burgesses of the same Borough, or the greater part of them, to commit such person refusing to prison, there to remain until he shall be willing to exercise the said office, or to impose a Fine upon him, as to them shall seem fit, and to detain him in prison until he be willing to render such fine unto them.”

“Know ye, that we of our more ample and abundant grace, and of our certain knowledge and mere motion, have assigned, nominated, and made, and ordained our beloved Thomas Burges, an honest man and inhabitant of our said borough, to be the first and modern Mayor of the same Borough of Truro.”

These extracts are translated from the Confirmation Charter of 31 Elizabeth, 1589, a charter which remained in force until the passing of the Municipal Corporation Reform Bill in 1835. (Pat. Roll 31 Eliz., pt. 13).

Of mayors of Truro previous to 1589, I have discovered the names of but four, the earliest being Wat. Devis, who, as mayor, was appointed one of the visitors to close the friary in 1538, The second, in 1573, was George Singleton, a descendant of the Singletons of Singleton Hall, Lancashire; having settled in Truro, he rose to eminence in the town, and a monumental brass commemorating certain members of his family was laid under the reading desk of St. Mary's Church. For many years previously to the demolition of the church it was lost, but its mutilated remains were recovered in 1880. In his account of Thomas Farnabie, a noted schoolmaster, Wood refers ("Athenae Oxonienses") to his grandfather as: "Farnabie, sometime Mayor of Truro;" he does not mention the year of his mayoralty, but the context seems to show that it was before 1589. The fourth of these mayors was Gregory Friggens, 1585; he afterwards became one of "the first and modern Capital Burgesses" under the provisions of Elizabeth's charter, and was again mayor in 1619, by which time he had become "an aged man."

In the earlier half of the seventeenth century two gentlemen whose names are still prominent in the city held the office of mayor. The former was Jenken Daniel, son of William Daniel, a representative of Truro in the parliament of 1660, and brother of Richard Daniel, who was mayor in 1622, and who represented Truro in the parliaments of 1624 and 1628. Jenken Daniel was mayor in 1615, and his name is on the inscribed stone, which, after being first placed in the original market house at the western end of the middle row, and then in the succeeding market house, has been finally built into the western wall of the present structure. The Daniel family at this period divided into two branches, one of which migrated to Madron; the other, represented by Jenken Daniel, remained at Truro. Jenken's brother, Richard, lent him large sums of money, which enabled him by judicious trading to acquire considerable wealth. His son, Jacob Daniel, was chosen as mayor in 1632; he was described by his cousin as being "rich, very rich," but the writer

adds that his father "was a man to raise him and he hath not done anything that I can hear, for any of us." The latter of the two mayors to whom reference has been made was Richard Hill. During his mayoralty in 1631, Williams' Almshouses and Hospital were erected, as may be seen from an inscription on a stone in the wall of the Almshouses facing Pydar Street.

The record of another mayor, contemporary with these, is preserved on a brass which was formerly in St. Mary's Church, and is now in the Cathedral—that of Cuthbert Sydenham, woollen draper, who was mayor in 1627, and died three years later.

In 1674, when certain structural alterations and improvements were being effected in the church, the Corporation resolved as follows:—"30 Oct., 1674. It is ordered and agreed that Mr. Robt. Avery the p^sent major doe send for soemuch veluett as will make a Cousing to sett in his seate in the Curch and the charges thereof shalbe allowed on his acct. and that he alsoe erect a Cheere and a Raill with a deske in the Comon Hall on the Bench, and the king's Armes over his head in said Hall if it may be conueniently done." Two years later, the Capital Burgesses, indignant at Avery's failure to present a satisfactory account of his mayoral expenses, resolved that "ffor as much as Mr. Robert Avery did vndertake and promise to bring in a pfect his account this present day (22 March 1676) as Mayor of the sd Borough, and made default As many tymes heretofore he hath Donne, Wee whose names are Subscribed doe order and direct that the sd Mr. Avery by all Lawfull wayes and meanes bee psecuted for the puosinge (*sic*) pfectinge and ballancinge of the same And that M^r. ffoote the Town Clarke forthwith doe the same." Then follow the names of eleven Burgesses, the first being that of "Nic. Sanders, Major."

Mr. Avery's conduct led to the discussion of means by which such irregularities might be prevented in the future; the result being that in 1678 the Corporation determined to appoint stewards who should relieve the mayor of his financial duties, and the following resolution, though opposed by Mr. Avery and his friends, was accordingly passed: "Wee doe hereby constitute and ordeyne that from henceforth, the Mayor for the tyme being after the expiracon of the office of the p^sent m^r Mayor shall not

receave or Intermeddle with the Recoueing of any mony belonging or to belong to the Towne aforesd. But that the Mayor, Aldermen, and Capitall Burgesses on or after the election of every new Mayor are to and shall chuse twoe of the Capitall Burgesses of the sd Borough to bee Stewards and Receanors of the Incom and Reveniue of the said Borough, And which Stewards are to continew During the continewance of such mayors mayoralty wherein they shalbee elected, And the said Stewards are to be accountable for the sd Incom vnto the sd Mayor, Aldermen, Capitall Burgesses at the vsuall tyme for accountying for the same." The first two Stewards elected were Henry Gregor, alderman, and William Gribble, gent.

To make the corporation's revenues still more secure from fraud, a committee of seven was appointed in 1686 "to examine, correct, adjust, and past (*sic*) every Mayors account from yeare to yeare after the expiracon of his mayoralty."

The mayor's allowance was a matter of much debate and of frequent modification. In 1678 the sum of twenty pounds was voted for the extraordinary charges of his mayoralty; and eight years later, twenty pounds were added "towards pvision for his kitchen." In 1689 it was "ordered, constituted and ordained, that every mayor of the sd Borough for the tyme being shalbe allowed and paid for every yeare out of the stocke of the Towne the some of forty poundes towards the charge of his kitchin." Towards the close of the 18th century the Borough finances were in a most unsatisfactory state, and among the suggestions adopted in 1790 for retrenchment in expenditure was the following: "That the allowance to the Mayor for Serjeants Cloaks, Gloves, Cravets, Hats, Fee of one shilling p. week each to the Serjeants, Passes, Expences of Serjeants, Constables and Petit Juries, all Dinners and Entertainments of every kind whatever shall be £40 p. annum, and that every further expence incurred by any Mayor beyond the said sum shall be paid out of his own pocket, and not allowed to be discharged out of the Corporation revenue without an Order expressly made for that purpose by a majority of the Corporation." Nine years later the allowance was cut down to twenty-five pounds, and "the money paid by him with passes was to be repaid by the Corporation which shall not be less than sixpence to each person." This sum was con-

sidered by many to be too small, and after four years' trial, it was decided in 1803, by 11 votes to 7, that "the allowance for the Mayor's Expences during his mayoralty shall be forty pounds, independent of the sums paid with passes."

During the mayoralty of Thomas Trewolla in 1684, Elizabeth's charter was surrendered to James II, and a new one was substituted for it; but its provisions did not long remain in force, and the corporation reverted to the former charter. Under this new charter, Henry George was duly sworn and admitted to the office of mayor. In addition to the usual oath, he was required, in common with all other mayors in the kingdom, to abjure the Solemn League and Covenant.

In those days, municipal authorities were money lenders on a large scale, and again and again we read of the difficulties they encountered in procuring the repayment of loans. The case of Henry George illustrates this,* and will be best told in the words of the official record: "8 March 1687. Whereas Henry George, gent. Late mayr. of Truroe Dyed Intestate and Whereas the said Henry George Dyed much indebted to the said Burrough, and Whereas it appeares that there is a designe that the said Burrough may bee by some meanes hindred from Receiving their Just Due and Whereas the said Burrough have contested the Administracon of the said Henry Georges goods in the Court of the Archdeaconry of Cornwall, and Whereas they have pceeded soe farr that the Judge in that Court hath decreed the Administracon to one Thomas George who we thinke and hath Appeared in the Court to bee an Ideot and not of sound minde but vnfitt to administer the goods of the said Henry George, Wherevpon there hath been an appeale entred on the behalfe of the said Burrough against the said Sentence, wee now being mett together doe order and agree that the said Appeale be psecuted at the cost and charge of the said Burrough And that the Mayor for the tyme being Doe laye out and expend the nessary cost and charges in and about psecuteing the same, If the matter cannot otherwise be composed." Apparently, the Corporation found it difficult to establish their case, for thirteen months later "it was agreed on that if John Mayowe, gent.,

*There is, however, nothing in the text to show that George's indebtedness had its origin in loan.—[Edd.]

Mayor of the said Burrough, John Pollard, Esqr., John Manley, Esq., and Edward Mayowe, or any three of them shall at any tyme hereafter thinke or pitch on any other wayes or meanes for recovery of the said Money it shall be lawfull for them to psecute the same at the charge of the said Burrough.”

The mayor in 1690 was Henry Herle, son of Rev. Charles Herle, rector of Winwick, Lancashire—a man esteemed by the Puritans as “the prime man of note, learning, and power, among the clergy.”*

The oaths of allegiance and supremacy required of all burgesses by Charles II proved to be distasteful to many men who otherwise would willingly have undertaken the duties of local government. Herle was of this number; and on his refusing to act as a Capital Burgess, when elected to that office, the Corporation ordered in October, 1678, that “one Mare taken by viture of a Warrant from William Gregor, gent., late Mayor of the said Burrough, from Henry Herle, merchant, formerly elected one of the Capitall Burgesses of the sd Burrough for his, the said Henry Herle’s refusing to bee sworne Capitall Burges, bee forthwith put to sale, and that the overplus, if any bee, above five pounds, bee returned to the said Henry Herle, the pvender and other charges beinge first deducted.” But to this order John Mayow, Thomas Trewolla, Matthew Rowat, and John Polter disagreed. The mare was sold, and in January of the next year, Herle was dismissed in the following terms: “fforas-much as Mr. Henry Herle was destreynd for Refusing to take the oath of Capitall Burgesse, and the distresse being one mare is sould, Wee Doe therefore Dismiss the said Mr. Henry Herle from being one of the Capitall Burgesses of the sd Borough.” Later in the year, however, he consented to be nominated and 9 November, was “elected of the number of the fower and Twenty Capitall Burgesses of sd Borough.”

Herle was tainted by the corruption prevailing in the public life of the times, and we find that in 1696 the then mayor, William Gribble, wrote to William Tailer, deputy auditor of the duchy of Cornwall, complaining that Henry Herle “had melted down about two tons of tin into bars without

* Carew’s “Survey of Cornwall,” edited by Lord de Dunstanville.

giving him notice." It appeared "that several persons had set up 'kettles' in their private cellars, particularly at Fowey, Truro, and Penryn, where under pretence of remelting into bars tin duly coined in the block, they could run down uncoined tin, and defraud the king of the duty, and undersell the fair-dealing merchant.* Herle was re-elected mayor in 1704, and again in 1705.

Henry Gregor, merchant, an ancestor of the Gregors of Trewarthenick, was mayor in 1694. He bequeathed to the borough the sum of forty pounds, "the Interest whereof is to bee paid for the preachinge of a funeral sermon by some able minister in memory of the said Mr. Henry Gregor annually att or on the Eleaventh day of March."

Notwithstanding all the safeguards adopted for preventing speculation by the mayors, the corporation still found that men sometimes abused their office; of these was Stephen Pawley, mayor in 1703. The official records give a full account of his doings "23 March 1704. Whereas Mr. Stephen Pawley late mayr of this Burrough, has duringe the tyme of his Mayoralty of, for, and wthin the said Burrough had and reced of the Rents, profitts, and pquisites of the same Burrough diverse and sundry sumes of money to a very great and considerable value, and also diverse and sundry bonds, notes, Aects., and other papers concerning and relating to the said Burrough for and concerninge w^{ch} (Tho application and request has been Severall times made to him not only by Mr. Henry Herle, and Mr. Rd. Thomas, two of the Capital Burgesses of the said Burrough, his stewards) But likewise the said Henry Herle the p^rsent Mayor: Yett notwithstandinge the said Mr. Pawley haveing reseiving and keeping these severall matters papers and things afores^d Does now altogether refuse to deliver vp Or account wth the May^r and Magistrates of the said Burrough for the same, Therefore, and for the reasons aboves^d wee the said May^r and Magistrates Doe hereby vnanimously consent and agree that ffrancis Gregor our Towne Clerke Dee forthwith prosecute the said Mr. Stephen Pawley by all such lawfull wayes and meaus and (*sic*) may or can

* Calendar of Treasury Papers.

induce compel and bring the said Mr. Pawley to a full and pfect acct. touchinge and concerninge the p^rmisses Matters and things aforesd.”

The records of mayoral elections from 9th October, 1712, to 9th October, 1722, are missing; in consequence, it is supposed, of the violent struggle for supremacy in municipal and parliamentary affairs between the Boscawens and the Vincents, one or other of the rival parties having perhaps destroyed them. John Prowse, “the good mayor,”* whose portrait hangs in the council chamber at Truro, was certainly in office in 1712. He was re-elected on 9th October of that year, and his signature as mayor is appended to the elections 9th October, 1722. It is therefore probable, as Polwhele conjectures, that he continued to act as mayor throughout the whole of that stirring time. An account of the mayoral contest in 1712 is preserved in the MSS. of the duke of Portland at Welbeck Abbey.† It gains in piquancy, if not in accuracy, through being the version of the affair given by the Vincent faction, and as it presents a graphic picture of the state of municipal affairs in the borough at that time, I quote it in full. Writing to the earl of Oxford on 30th September, 1712, Lord Lansdowne says: “Mr. Vincent and his son are going post to-morrow for Cornwall, to be present at the election of a mayor for the town of Truro, where we are in danger, or rather, under a certainty of losing both members at the next choice for a parliament, unless your Lordship is pleased to give your assistance. I have appropriated every penny of my own rents in that country for services of this kind, being attacked in every corporation. It is not to be imagined what efforts have been made, and what money has been lavished upon this occasion. The contention and expense is greater than ever was known upon the choice of a Parliament, so much the enemies of the Government have thought it necessary to be beforehand with us in securing the returning officers. The result, therefore, of my conversation with these two gentlemen, who are entirely devoted to your interest is that I should in this manner acquaint you with the necessity of your help. The mayor must have a hundred pounds, and one of the magistrates, whose debts Mr. B [oscawen]

* Polwhele's "History of Cornwall."

† Published in 1899 by the Historical MSS. Commissioners.

has offered to pay, which amount to about three hundred pounds, must be satisfied by us, and this will not only settle the town for the present, but for ever. Mr. Manley, who knows the particular state of this whole matter, will better inform you, but 'tis certain, if this opportunity be lost, 'tis never to be retrieved."

Two days after the election, Henry Vincent, junior, wrote as follows to the earl of Oxford: "In obedience to your Lordship's commands, I here present you with an account of the most material occurrences at Truro since my being in the country; and, as that relating to bribery is the most remarkable, I shall beg leave to begin with it. Cha. Herle,* whom your Lordship lately favoured with a commission, was told his commission was only a sham that would be attended with no pay, but if he would vote for Mr. Boscawen, he should immediately have £600 to buy him a commission in a standing regiment, and two hundred guineas to equip him, with promises of future favours when the Whigs came uppermost, which was to be very soon, the present ministry being a parcel of beggarly, worthless fellows, whom the Queen was weary of, and would discard within three months, but all that was said could not prevail with him to alter his resolution of continuing firm as before. Hickman, who was thought to be a lover of money, was three times attacked by Mr. Boscawen in person the day before the election of Mayor, the last time, late at night, when he told him if he would engage in his interest, he should have £1,000 on the spot, and this, too, backed by entreaties in the meanest manner, saying:—'Pray, Mr. Hickman, for God's sake, sir, if you don't vote for me, I shall be undone, my interest will be totally lost.' Hickman's reply was that if he expected his vote was to preserve (him) he would be mistaken, for he could not nor would not be for him. The Mayor was taken to the tavern and kept till morning, and then told that if he would come over to Mr. Boscawen, he should have £1,200 instantly carried to his house, and it being then a private time, nobody could know of it; but he rejected their proposals with contempt, saying he would not sell his principles for money, and that he had heard Mr. Boscawen had called him rogue behind his back, but was resolved he should never make

* Son of Henry Herle.

him one. Watt. Jones, another magistrate, was the night before, and the morning of the election, tempted with a still larger bait, being to have all his debts paid, £500 ready money, and £100 a year for three lives; but this [had] no more influence on him than any of the others. Sam. Moyle, whom your Lordship had heard me mention to be so poor that we were forced to take him into our house and maintain out of our pockets, was offered £1,000 as portion for his daughter, and another for himself, was so honest, though his daughter came crying about him to accept the proposal, to return an answer by letter, that if they would give him £10,000, he would not leave his friends, but would rather die in a jail than touch their moneys. Notwithstanding they have been balked in all their endeavours, they have not yet given over, for this very afternoon Pagett's wife, in company with one of Foott's daughters, attacked Slade's wife, who is in child-bed, with great temptations, yet to come into Boscawen's interest. I shall make no reflections on these proceedings, but only say, if the like be practised in other places, it will behove the Attorney-General to hasten his prosecution for the two-and-a-half per cents., or I doubt the money will be expended before the cause is determined. . . . The old mayor continues."

A BOTANICAL REPORT FOR 1904.

By FRED HAMILTON DAVEY, F.L.S.

The report which I lay before you to-day is one of the most noteworthy which it has been my privilege to bring to any meeting of this institution. Last year, among other items of information, I submitted particulars of a number of plants which during the year had, for the first time, been found in the county. Interesting as some of these discoveries were, and necessary as it was to place them on record, only a few of them will find a permanent place in our literature, for the simple reason that they are not likely to obtain a permanent footing on our soil. Aliens or casuals, in many instances they survive only a single season in their new surroundings, and in the majority of cases they disappear entirely after two or three years.

To-day I am able to mention the names of twelve species which have been recently added to our flora, eleven of which rank as natives, as well as several sub-species and varieties. As far as I can find, no other year can show a like record, and this record becomes the more remarkable when it is remembered that out of the twelve new species one is not known to occur in any other part of the world, and, as far as we can yet say, another does not favour any other county in Great Britain or Ireland. All this is strong testimony to the thoroughness with which we are endeavouring to carry out our investigations, and is a caution against the danger of undue haste in the publication of the material which I am collecting for a trustworthy guide to our county's flora. It also further emphasises the almost insular character of our flora, inasmuch as it enables us now to claim for the duchy fifteen plants for the existence of which in other parts of Great Britain evidence is wanting.* Such a record, if not absolutely unique, is surpassed by but few counties south of the Tweed.

* The plants referred to are: *Fumaria occidentalis*, the unnamed *Fumaria*, *Lavatera sylvestris*, *Cytisus scoparius*, var. *prostratus*, *Trifolium Molinerii*, *T. Bocconi*, *Ornithopus ebracteatus*, *Erica vagans*, *Echium plantagineum*, *Herniaria ciliata*, *Juncus pygmaeus*, *J. capitatus*, *Bromus rigidus*, *Chara fragifera*, *Nitella hyalina*.



A x2

About $\frac{4}{5}$ nat. size.

B x2

H.W. Pugsley del.
S. C. Hendrey lith.

West, Newman imp. London.

Fumaria occidentalis Pugsley (rampant form).

1. PLANTS NEW TO CORNWALL.

My "Tentative List" of Cornish plants credits the county with forty-six species of brambles. Until this summer nothing of importance had been added to the list as few, if any, of our local botanists have yet contracted the "bramble fever." During the months of July and August we were visited by such eminent students of this extensive and difficult section as the rev. W. Moyle Rogers, the rev. F. A. Rogers and Mr. G. Claridge Druce, and as a result of their observations the number of species now known to occur in Cornwall has been increased to fifty-three, with four additional sub-species and three varieties. In his recently published "Flora of Hampshire," Mr. Townsend enumerates seventy species of brambles for that county, "which perhaps, with one exception, makes Hampshire richest in brambles of all the counties in England." When we remember that for botanical purposes Hampshire (including the Isle of Wight) has an area of 1,032,105 acres, while Cornwall has only 887,740 acres, I think we may justly claim the latter as one of the bramble counties of Great Britain. In this direction there is still much to be done, and I shall feel grateful to any resident botanists who have the leisure and the ability if they will embark on such an important work.

Fumaria occidentalis, Pugsley. In the "Journal of Botany" for August, 1904, Mr. H. W. Pugsley published a full account of this new species. The next issue of the "Journal" contained an excellent plate of the plant, also the work of Mr. Pugsley, and through the kind services of Mr. J. D. Enys permission has been obtained from the editor to use the illustration for the present paper. The plant has been drawn about four-fifths natural size, and there is a detached flower and fruits showing profile and rugosity as seen when dry, about twice natural size.

There are many things about the history of this recent discovery which combine to give it more than usual interest. My friend and industrious co-worker, Dr. C. C. Vigurs, must be credited with being the first to introduce the plant to the attention of British botanists.* Like most of us, for a few years

* Dr. Vigurs was present at the reading of this paper, and followed my remarks with a lucid description of the plant, fresh specimens of which were handed round for inspection.

he more or less flirted with botany. When, in 1898, he took up the subject seriously he was puzzled about a large-flowered fumitory of the *pallidiflora* type which was very common in and around Newquay, and which would not tally with any description to which Dr. Vigurs then had access. Two or three batches of specimens were first sent to Mr. G. C. Druce, of Oxford, but without satisfactory result, and until 1901 the foundling received no further attention. In that year Mr. A. O. Hume came to Newquay, and was shown the plant, specimens of which were taken for his herbarium. During the spring of 1902, when examining Mr. Hume's *Fumaria*, Mr. Pugsley "remarked, under *F. pallidiflora*, a form from Newquay, Cornwall, which I could not assign to any recognized British species; and very shortly afterwards the rev. H. J. Riddelsdell sent me a similar plant from Helston. Both of these plants were noticeable for their handsome flowers and large rugose fruits. In the following year . . . while at Penzance in quest of *F. speciosa*, I met with a splendid patch of rampant fumitory, which I immediately saw was quite new to me, and identical with the plants gathered by Mr. Hume and Mr. Riddelsdell."* More recently, when looking through the herbarium of Mrs. E. S. Gregory, of Weston-super-Mare, Mr. Pugsley found similar specimens, labelled "Margin of a wood, Lelant."

After carefully looking up the literature of the subject, and consulting most of the leading continental herbaria, Mr. Pugsley was satisfied that he had unearthed not only a new plant, but also a plant whose range was apparently restricted to West Cornwall. With *F. purpurea*, whose discovery in Cornwall I announced a year ago, it constituted a second endemic species for Britain. As this is one of the most important botanical discoveries of the year, I take the liberty to introduce Mr. Pugsley's description of the plant.

"A plant of more robust habit than any other British fumitory, short, suberect and branchy when growing in open fields, or with long, trailing stems on walls and hedgebanks. Leaves 2-3 pinnatisect; with flat, incised leaflets and oblong-lanceolate lobes, obtuse-mucronate or acute, usually a little

*" Journal of Botany," August, 1904, p. 217.

narrower than those of *F. capreolata*. Petioles often cirrhose in rampant examples. Racemes up to 20-flowered, rather lax and lengthening in fruit; peduncles about as long as the racemes, the lower sometimes longer. Bracts lanceolate-acuminate, usually nearly as long as the fruiting pedicels, but occasionally much shorter. Pedicels much thickened at the tip, straight and suberect in fruit in open field forms, or arcuate and slightly decurved in rampant plants. Flowers larger and more handsome than in any other British form, 12-14 mm. long, rosy-white; upper petal rather broad, keeled, subacute, with broad wings reflexed upwards, and reaching its apex, the wings externally dark purple below, with well-marked whitish margins before fertilization; lower petal with green keel and broad, whitish, spreading or slightly deflexed wings, which extend to its apex; inner petals curved upwards, obtuse, apiculate, tipped with dark purple. Sepals 4-5½ mm. long and 2-3 mm. broad, ovate, acuminate, frequently irregularly incise-dentate towards the base, white, with greenish dorsal nerve, at least as broad as the corolla-tube. Fruits large, subrotund, smooth and pointed when fresh, with an inconspicuous neck slightly narrower than the tip of the pedicel; when dry, coarsely but not deeply tubercular-rugose and distinctly keeled-compressed, with two shallow apical pits, and the keel drawn into a very short, blunt beak, which is notched at maturity.

“So far as British plants are concerned, *F. occidentalis* can hardly be mistaken for any other species, at least in the herbarium, its large, coarsely rugose fruits being quite distinct. When growing, it is perhaps liable to be confounded with *F. confusa*, or, more probably, in the rampant state, with *F. capreolata*, whose aspect it then assumes to some extent, owing to the pale and recurving flowers. It may be distinguished from *F. confusa*, in addition to the larger and pointed fruits, by the size of its flowers, with white-edged purple on the upper petal, and proportionally larger sepals and longer bracts. The rampant forms are best separated from *F. capreolata* by the same fruit characters, and by the shape of the corolla; the broad and broadly winged upper petal and spreading margins of the lower one, characteristic of the *Agraria*, contrasting sharply with the narrow, pointed petals, the upper little winged, and the lower

with erect, almost obsolete margins, which are found in *F. capreolata*." *

Fumaria ? For the addition of this *Fumaria* to the British flora, I happen to be responsible. In its own way it is not less interesting, and certainly not one whit less beautiful than *F. occidentalis*. Whether it will form a third endemic species for Britain, and, like *F. occidentalis*, be found to be restricted to Cornwall, are points that cannot be determined until Mr. Pugsley has investigated the matter with that thoroughness which is a characteristic of his work. I first found the plant on October 8th in a potato-field at Gilly Tresamble, near the western extremity of the parish of Perran-ar-worthal. It was growing in the company of *F. confusa* and *F. officinalis*, from both of which it was strongly marked off by its more robust appearance, and its longer and more lax racemes of large bright-coloured flowers. A fortnight later I found it in another field two miles distant from the first, and a few days after I discovered it in plenty in three other fields lying midway between these two. Being anxious to know if the plant occurred in other parts of the county, I at once drew up a rough working description of it, and sent it to my willing helper, Mr. William Tresidder, of Goonhavern, inviting him to keep a look out for the stranger. In a short time success attended his search, and he was able to send me typical specimens from the Perranzabuloe district. British botanists are now anxiously awaiting Mr. Pugsley's verdict on the plant. His letter, acknowledging receipt of fresh specimens, runs as follows:—"I think you have added a new name to the British list. Your plant is undoubtedly allied to *F. Borœi* and *F. confusa*, and is probably near the latter, from which it differs in the dark-tipped corolla, slightly larger and broader sepals, still shorter bracts and rugulose acute, instead of rugose, more obtuse fruits. It may, in fact, be regarded as a *confusa*, with the colour of *Borœi* and *muralis*, and the fruits of *muralis* somewhat enlarged. It is almost identical, according to Jordan's description, with his *F. vagans*, a French species, which, together with *F. confusa*, was united by Haussknecht with *F. Gussonii*, Boiss., under the latter name. There is no doubt to

* "Journal of Botany," August, 1904, pp. 218-220.

my mind, though, that it is as different from *F. confusa* as *F. muralis* is from *F. Borci*; perhaps more so."

That three brand new species of *Fumaria* should be added to the flora of Cornwall in the short space of twelve months, will ever be remembered as an extraordinary event. As it is possible other forms still lurk undetected in a Duchy as Delectable to the botanist as it is to the student of humanity, I hope special attention will be given to the genus during the coming year by everyone of my helpers.

Rubus fissus, Lindl. Seeing it has a distribution extending from Devon to the Orkney Islands, the occurrence of this bramble in Cornwall might have been suspected. At one time, indeed, it was reported from several localities, but on consulting the rev. W. Moyle Rogers, I was advised to put the stations which had been published for this species in the "Journal of Botany," 1886, as well as those appearing in Briggs' "Flora of Plymouth," under *R. plicatus*. Consequently *R. fissus* appears in my "Tentative List" in brackets, indicating that it had been wrongly recorded for Cornwall. This year *Mr. G. C. Druce* collected this bramble near Bodmin, and forwarded voucher specimens to the rev. W. Moyle Rogers.

R. nitidus, W. & N. This species is also placed in brackets in my "Tentative List," but the rev. W. Moyle Rogers has recently called my attention to the fact that in his "Handbook of British Rubi," p. 100, though he had not seen specimens, he accepts the plant for East Cornwall, on the authority of *Prof. Areschoug*.

R. Cariensis, Rip. & Genev. "Handbook of British Rubi" says this is "locally abundant in the west, especially in Devon." It seems to have attained its maximum distribution in Wales, where it has been found in the counties of Glamorgan, Brecon, Carmarthen, Cardigan, and Carnarvon. In England it has been recorded for Dorset, South Somerset, and North Devon. By *Mr. Druce's* discovery of it at Bodmin, Cornwall has been brought into line with Devon.

R. thyrsoideus, Wimm. Entered in my "Tentative List" as one of the erroneous records for Cornwall, the *rev. W. Moyle Rogers* has recently restored it to our flora. On the Lizard

Downs and at Mullion Cove he has found it locally abundant; "a strong form with showy pink (or mauve) flowers, and leaflets more shortly stalked than usual, and also darker green above and less constantly grey-felted beneath." This bramble occurs in South Devon, but in no other southern county until Berkshire and Surrey are reached. Scotland is not known to possess it, Cheshire being its most northerly limit.

R. pyramidalis, Kalt. Submitted to the rev. W. Moyle Rogers by the rev. F. A. Rogers, who found it near Halfway-house, between Penryn and Helston. There was every reason to suspect the presence in Cornwall of a plant which ranges from Devon to West Ross, and which has a home in some Welsh counties.

R. infestus, Weihe. Here we have another species with a wide distribution, but, according to the "Handbook of British Rubi," uncommon in most districts. In August last the rev. W. Moyle Rogers found one bush, and that without mature stem, on the south slope into Mullion cove. Records for Devon are still wanting.

R. scaber, W. & N. Specimens gathered at Bodmin by Mr. Druce have been examined by the rev. W. Moyle Rogers, who thinks they represent "a very strong form." Reference to my "Tentative List" will show that a previous county record for it was so doubtful that I felt obliged to put it in brackets.

In addition to the foregoing species of brambles, I am now able to introduce for the first time into a Cornish list the following sub-species and varieties:—

R. nitidus, W. & N., subsp. **opacus**, Focke. Another of Mr. Druce's additions to our flora, Bodmin being the place where it was found. In "Handbook of British Rubi" it is recorded only for South Devon, North Somerset, Dorset, East Kent and Monmouth, though the species itself occurs as far north as West Inverness.

R. argentatus, P. J. Muell, var. **robustus**, P. J. Muell. Penryn to Helston, rev. F. A. Rogers, teste rev. W. Moyle Rogers.

R. macrophyllus, W. & N., subsp. **Schlechtendalii**, Weihe. Calstock, T. R. A. Briggs, teste rev. W. Moyle Rogers.

R. leucostachys, Schleich, var. **angustifolius**, Rogers (*R. lasiocladus*, Focke, var. *angustifolius*, Rogers, "Handbook of British Rubi."). Truro to Penryn, rev. *F. A. Rogers, teste rev. W. Moyle Rogers.*

R. anglosaxonicus, Gelert, subsp. **curvidens**, A. Ley. Specimens found at Castle-hill, Falmouth, by the rev. *F. A. Rogers*, are labelled "apparently a form of this," by the rev. *W. Moyle Rogers.*

R. rosaceus, W. & N., subsp. **Powellii**, Rogers. Found by *Mr. Druce* in a moor west of Truro. It is abundant in the more elevated parts of Epping Forest, and is also found in west Kent and Oxfordshire. Its discovery in Cornwall is a curious side-light on plant geography.

R. dumetorum, W. & N., var. **ferox**, Weihe. Fowey, *G. C. Druce.*

Potentilla norvegica, Linn. In June I found this plant in rather sparing numbers around Par Harbour. From all other British species of this genus it may be distinguished by its trifoliolate radical leaves and numerous small yellow flowers, rather crowded at the top of the plant. Although of quite modern introduction into the country, it has thoroughly established itself in Yorkshire, Middlesex, Cambridgeshire, Hertfordshire, York, and few other counties. Its attempt to find a permanent place on Cornish soil will be watched with interest.

Salicornia stricta, Dumort. Specimens of the glasswort gathered by *Dr. Vigurs* at the Gannel, Newquay, and submitted to two specialists, have been referred to this species.

S. ramossissima, Woods. *Dr. Vigurs* has also collected this at the Gannel.

Observation on the genus *Salicornia*. No British county has had its glassworts more sadly neglected than Cornwall, and until very recently in no county had anything like justice been done them. Most botanists have been aware of the existence of forms which do not answer to the accepted diagnosis of *S. herbacea*, Linn, but the literature of the subject has been too indefinite and scattered to allure many students to a thorough local investigation of the genus. Another great drawback has been in the plants themselves. For the most part, if carefully

selected and preserved, botanical specimens can be as satisfactorily studied in the herbarium years after being gathered as when they are fresh, but, owing to their succulent nature, glassworts lose many of their characteristics in pressing and drying, and a study of herbarium specimens for critical purposes is an unsatisfactory if not even an impossible work. Moreover, the difficulty is further involved by the mutations through which each form goes from the young to the adult stage.

Many, if not the whole, of the localities quoted in my "Tentative List" for the old aggregate *S. herbacea* should give *S. stricta* and *S. ramosissima*, as well as the variety *procumbens*, which under the rearrangement of nomenclature now takes specific rank as *S. procumbens*, Sm. With the hope that it will facilitate investigations, I quote the diagnosis of these three plants as given by Mr. Townsend in the new edition of his "Flora of Hampshire":—

S. stricta, Dumort. "Plant erect, branches spreading or ascending, spikes cylindrical, 2—3 inches long; shield somewhat convex; spiral cells few and ill-formed; colour green, generally glaucous, never red; 10—15 sets of seeds.

S. procumbens, Sm. Decumbent, never strictly erect, and with a bend at the top of the root; branches and sub-divisions much shorter and more numerous and divaricate than those of *S. stricta*, lower branches much longer than the succeeding ones and frequently recurved; shield concave; spiral cells numerous and well-formed; colour at maturity red; six sets of seeds.

S. ramosissima, Woods. A larger plant than either of the preceding, erect, much branched and bushy, branches ascending; spikes often neither cylindrical nor oblong, but somewhat lanceolate, the longest about 1 inch long; colour grass green touched with red; 10—15 sets of seeds."

2. ADDITIONAL LOCALITIES.

A full record of what has been done during the year in the way of adding new localities to the plants appearing in my "Tentative List" cannot be thought of here. I shall therefore confine my remarks to some of the rarer or local species.

Ranunculus heterophyllus, Bab. Pool near Harlyn Bay, St. Merryn, *W. Barratt*. This is a new record for vice-county 2.

R. arvensis, Linn. Cornfield between St. Erth Station and St. Erth, *J. Lawson*.

Neckeria claviculata, N. E. Br. Woods in the valley of the De Lank river, *Clement Reid*

Lepidium ruderales, Linn. Waste land, Marazion, *J. Lawson*.

Erysimum cheiranthoides, Linn. Par, *F. H. Davey*.

Crambe maritima, Linn. One plant on the beach between Marazion Railway Station and Long Rock; one nearer Marazion; one large plant on the pebbly shore near Perranuthnoe, *J. Lawson*.

Reseda alba, Linn. Par, *C. C. Figurs*.

Medicago denticulata, Willd. Marazion, *J. Lawson*.

Rubus erythrinus, Genev. Bodmin, *G. C. Druce*. Truro to Penryn; Flushing, *rev. F. A. Rogers*. Mullion Cove; Goonhilly Downs, *rev. W. Moyle Rogers*. New to vice-county 1.

R. nemoralis, P. J. Muell. Goonhilly Downs, and road thence to Mullion, *rev. W. Moyle Rogers*.

R. pulcherrimus, Neum. Flushing; Penryn to Helston and the Lizard, *rev. F. A. Rogers*. Lizard Downs to Cadgwith, *rev. F. A. Rogers* and *rev. W. Moyle Rogers*. Mullion, a very strong form on the north and south slopes of the cove, and beyond towards Pradannack, *rev. W. Moyle Rogers*. Loe Pool, Helston, *G. C. Druce*. New to vice-county 1.

R. mucronatus, Blox. Truro to Penryn, *rev. F. A. Rogers*.

R. oigocladus, Muell. & Lefv. Fowey, *G. C. Druce*. "Apparently this," *rev. W. Moyle Rogers*.

R. Balfourianus, Blox. Housel Bay and Cadgwith, *rev. W. Moyle Rogers*.

Apium inundatum, Reichb. fil. Marazion Marsh, *J. Lawson*.

Matricaria Chamomilla, Linn. Withiel, Bodmin, St. Breock, *R. V. Tellam*. Par, *F. H. Davey*.

Picris hieracioides, Linn. St. Mary's, Scilly Isles, *J. Lawson*. An addition to the flora of the Islands.

Primula acaulis × **veris**. Porthcothan Valley, St. Merryn, *Mrs. Hughes*. Perranzabuloe, *W. Tresidder*.

Lycium barbarum, Linn. Marazion, *J. Lawson*.

Linaria supina, Desf. This plant was recorded for "sides of embankment at Hayle," by a Mr. Westcombe in the "Phytologist," 1848, but as the late Dr. Ralfs was never able to find it, it was thought to be extinct there. *Mr. J. Lawson* now reports: "Several plants in full flower near the end of Hayle embankment (south side), April 27th, 1904, others in flowers June 8th and again June 28th."

Mimulus Langsdorffii, Donn. Marsh between Marazion and St. Erth, *J. Lawson*.

Mentha alopecuroides, Hull. Roadside Greensplat, Gwennap, *F. H. Davey*.

Scutellaria galericulata, Linn. Marazion Marsh, *J. Lawson*. An interesting addition to Dr. Ralfs' "Flora of West Cornwall."

Teucrium Chamædrys, Linn. On a bank where the field path from Marazion to Perranuthnoe joins the road behind the church, August 13, 1904, *J. Lawson*.

Chenopodium Vulvaria, Linn. St. Michael's Mount, *J. Lawson*.

C. murale, Linn. One plant as a garden weed at Ponsanoth, *F. H. Davey*.

Polygonum maritimum, Linn. Gunwalloe, August 1st, 1904, *G. M. Yule, teste rev. W. Moyle Rogers*.

Daphne Laureola, Linn. One plant near a small plantation half-way between Perranuthnoe and Cudden Point, *J. Lawson*.

Ceratophyllum demersum, Linn. In a ditch near Marazion, *J. Lawson*. Another striking addition to Dr. Ralfs' "Flora."

Panicum glabrum, Gaud. Long Rock, *J. Lawson*.

Polypogon monspeliensis, Desf. Lamorran, in fair quantity, *Miss Williams*.

Bromus arvensis, Linn. Frequent at Falmouth Docks,
F. H. Darcy.

Lolium temulentum, Linn. Marazion, *J. Lawson.*

Hymenophyllum tunbridgense, Sm. Prideaux Wood,
Luxulyan, *E. W. Rashleigh.*

3. THE EYEBRIGHTS OF CORNWALL.

Arranged as it was in accordance with the order observed in the ninth edition of the "London Catalogue," my "Tentative List" takes cognizance of one species of eyebright only, the varieties and forms then known to occur in the county being grouped under the old aggregate *Euphrasia officinalis*, Linn. In 1897, just two years after the publication of the last edition of the "London Catalogue," Mr. F. Townsend summarized his almost life-long critical labours on the genus in the form of an illuminating Monograph of British forms, which appeared in the pages of the "Journal of Botany." That event marked an epoch in the development of our knowledge of British eyebrights. With a workable account of the genus at their service, many botanists have been induced to take up the study, and slowly but surely order is coming out of long-standing confusion. The late Dr. Ralfs made a brave attempt to unravel the eyebrights of West Cornwall, and in this direction he may be regarded as something of a pioneer; but he was an old man when he embarked on the study, and the master-hand had lost much of its cunning. More recently Dr. Vigurs has applied his mind to the subject, and with that desire for accuracy which I have always been able to associate with his work he has, either personally, or through Mr. A. O. Hume, obtained the opinion of Mr. Townsend on the whole of his gatherings. His records therefore may be accepted as being as accurate as our present knowledge of the subject will allow us to claim accuracy. Here, as in several other connections, I wish to record my indebtedness to Dr. Vigurs for his unstinted assistance and valuable advice.

So as to bring our knowledge of the Cornish forms of the genus up to date, I have incorporated the records appearing in my "Tentative List" with those handed to me by Dr. Vigurs and the rev. W. Moyle Rogers. With the number of botanists now at work in Cornwall, the list should be considerably augmented next year.

Euphrasia brevipila, Burn. et Gren. Münster, 1885, *rev. W. Moyle Rogers*. Plentiful in patches on Quintrell Downs, and by roadsides near. There was also (1902) on Quintrell Downs a plant apparently a hybrid between *nemorosa* and *gracilis*, *C. C. Figs.*

E. nemorosa, H. Mart. This is the common roadside and meadow form, found everywhere from the Tamar to the Land's End.

E. curta, Fries. A stunted plant on Newquay Headland is thought by Mr. Townsend to belong to the variety *glabrescens*. Mullion Cove, *rev. W. Moyle Rogers*.

E. occidentalis, Wettst. Efford Down, Bude, 1882; Widmouth, 1883; Boscastle, 1885, *rev. W. Moyle Rogers*. Golf Links, Newquay; Perranporth, plentiful where it grows, *C. C. Figs.* Kynance Cove and Downs south of Mullion, *rev. W. Moyle Rogers*. Kynance, *J. Cunnack, Herb. rev. W. Moyle Rogers*. Carbis Bay; Marazion Marsh; Pra Sands; Sennen Green, *Dr. Ralfs*. Land's End, *Arthur Bennett*.

E. gracilis, Fries. Plentiful on Quintrell Downs, and near Victoria Inn, Roche. Easily distinguished by the wiry, strict branches, with very small leaves, and the whole plant reddish brown, *C. C. Figs.* Kynance Downs, and Downs south of Mullion, *rev. W. Moyle Rogers*. Chy-an-hal; near New Bridge; Sennen, *Dr. Ralfs*. Near Penzance, *Arthur Bennett*.

E. Rostkoviana, Hayne. Between Bridgerule and Whitstone, 1886; Boscastle, 1885, *rev. W. Moyle Rogers*. Newlyn East Downs, not very plentiful, and apparently over a small area, *C. C. Figs.*

4. EXCLUSIONS.

Every botanist who has undertaken the preparation of a county flora has found it as necessary to concern himself with what he should keep out of his list as with what he should include. Through confusion of nomenclature, carelessness on the part of helpers, and a lack of critical knowledge by many of the older botanists, records of the most surprising kind have been made for probably every British county. A new era will have dawned on botanical topography when observers have become alive to the necessity of preserving voucher specimens for all critical

records. With these at his service, the compiler of a local flora would be able to test each record, and his work would be safeguarded against many of the lamentable errors which have found their way into books of this kind. In the absence of voucher specimens, I now make it an absolute rule to accept no record, whether old or recent, for critical species, unless the record is from an observer of known ability. Had this condition been earlier enforced, much of the work that has been done in Cornwall and elsewhere would have been relieved of the charge of inaccuracy, a charge in many instances unfortunately only too true.

Last year I mentioned the names of thirty-three plants which at some time or other had been mentioned as occurring in Cornwall, and which I considered had not the slightest shadow of claim to our soil. Further investigations compel me to add another fifteen plants to the lists of exclusions.

Ranunculus fluitans, Lam., var. **Bachii** (Wirtg.). In the "Annual Report" of the Royal Cornwall Polytechnic Society for 1856, Mr. H. Charlton Bastian mentions this plant as occurring in a pond at Glendurgan. According to Dr. Ralfs' "Flora," the late Mr. W. Curnow also gathered the plant there in 1878. I very naturally shrink from challenging a record by two such eminent botanists, but in the absence of voucher specimens I see no other course than to omit the plant from the Cornish list. It must not be forgotten that *R. fluitans* is typically a plant of rivers, not of ponds, and that even as late as the date of Mr. Curnow's record our Batrachian Ranunculi were but badly understood by our very best botanists. If the plant is ever re-discovered at Glendurgan, it will probably be found to be *R. pellatus*. Mr. J. Cunnack's West Cornwall record for *R. fluitans* in "Topographical Botany," 1883, is undoubtedly identical with Bastian's, of whose paper in the Polytechnic Society's "Report" both Mr. Cunnack and Mr. F. P. Pascoe made extensive use when drawing up their list of Cornish plants for Mr. H. C. Watson.

Fumaria muralis, Sonder. Three places are quoted for this species in my "Tentative List." The specimens on the strength of which the plant was regarded as Cornish have

been submitted to Mr. Pugsley, who pronounced them robust forms of *F. Borei*. In Cornwall, as elsewhere, almost inextricable confusion has existed in connection with the capreolate fumitories, but it is encouraging to find that several reliable observers are now giving them attention, and soon we may hope to have something like an accurate account of their distribution. It must not be assumed that *F. muralis* does not occur in Cornwall. All that we are entitled to say at present is that it is not known to occur there. That there is satisfactory evidence for its presence in Devon raises the hope that it may yet be found in Cornwall, and I trust every field botanist will be on the look out for it.

Isatis tinctoria, Linn. I cull the following statement from p. 248 of vol. 2 of "A Book of the West":—"The woad, wherewith our British ancestors dyed themselves, flourishes abundantly in the Meneage peninsula. It has bright yellow flowers in panicles growing on an upright stem, some two or three feet high and appears in June and July." As far as my own researches have gone, no other writer mentions the woad for Cornwall, nor have I heard of any botanist who has handled a Cornish specimen. There can be no doubt, I think, that the rev. S. Baring-Gould was thinking of *Genista tinctoria*, not *Isatis tinctoria* when he penned the above quotation. Even then, his description of the plant, as bearing "bright yellow flowers in panicles growing on an upright stem, some two or three feet high," would be quite wide of the mark.

Stellaria nemorum, Linn. In the "Botanical Gazette," 1850, Mr. F. P. Pascoe mentions this plant as having been found in Boconnoc Wood, near Lostwithiel. My "Tentative List" credits Mr. A. O. Hume with having collected it more recently at Penzance. Of Mr. Pascoe's specimen I can find no trace. At my request Mr. Hume has lately examined his, and has reported that it is altogether too poor for satisfactory identification. According to "Topographical Botany," there is no reliable authority for its occurrence South of Monmouth.

Arenaria tenuifolia, Linn. The places and authorities quoted for this in my "Tentative List" are: St. Austell, the rev. J. P. Jones, in "A Botanical Tour through various parts

of the Counties of Devon and Cornwall," 1820; Ruan Minor, F. T. Richards; "three and a half miles from the Land's End, on the side of a watery bank," T. Martyn, in "Plantæ Cantabrigienses," 1763. Jones' "Botanical Tour" contains plenty of evidence that the author's uncorroborated *ipse dixit* on different plants must be accepted with caution, and that in the present, as in not a few other instances, we have an obviously erroneous record. With the commoner plants of the two westernmost counties Jones had a fairly intimate acquaintance, but his knowledge of the rarer ones was restricted to a degree. Martyn's record may be best described as stillborn, as *A. tenuifolia* is usually a plant of dry places, not watery banks, as he states. Unfortunately for the value of many of his records, Mr. Richards has never made it a practice to press specimens. Through that cause his Ruan Minor plant, whatever it may be, must be referred to some other species than *A. tenuifolia*. According to "Topographical Botany," Cornwall and Devon do not come within the range of this rather local plant. Probably enough in all three cases above mentioned impoverished examples of one of the three recognized varieties of *A. serpyllifolia* were gathered.

Vicia lathyroides, Linn. For this plant my "Tentative List" quotes no fewer than five Cornish records. Seeing the plant is not known to grow in Devon, and that I have not met anyone who can show me a Cornish specimen, this is rather amazing. Here again, and for reasons already given, credence must be refused Jones' record for Fowey. Mr. Bastian's statement that the plant is rather plentiful at Pendennis, near Falmouth, is one of those puzzling records which one often meets in botanical lists of bygone days, and for which no satisfactory explanation can be offered. What he must have examined was *V. angustifolia* or its variety *Bobartii*, as the locality has been frequently searched for *V. lathyroides*, and always without success. Of Mr. Glasson's and Mr. Allen's specimens, if any were preserved, I can get no information, and Mr. Besley's confession that he was only a beginner at botany when he recorded the plant, puts his locality out of court.

Myriophyllum verticillatum, Linn. When preparing the material for his "Topographical Botany," Mr. H. C. Watson

appears to have allowed no record to pass without a close scrutiny and a careful consideration of probabilities and possibilities. For the plant now under notice he received a record for West Cornwall from Mr. R. V. Tellam, but either Mr. Tellam must have communicated it with certain reservations or Mr. Watson was not satisfied with the evidence offered on its behalf, for he follows the name of the district with a question mark. Here again, we have recorded for Cornwall a plant which "Topographical Botany" does not mention for Devon, Dorset or South Somerset. It is further worthy of mention that although Mr. F. P. Pascoe, in the "Botanical Gazette," 1850, mentioned Pencalenick, near Truro, and Chy-an-hal, near Penzance, for this water milfoil, Mr. Watson passed these places over in silence, and his silence is always as significant as his sarcasm.

Sium latifolium, Linn. Another of Mr. Pascoe's doubtful communications to the "Botanical Gazette." It was made on the authority of a Mr. Ward, who claimed to have found the plant "in a ditch near the Priory, Bodmin." Devon does come within its range, but until someone can produce a Cornish specimen, Mr. Ward's reputed find must be omitted from future lists of plants occurring in the County.

Galium Vaillantii, DC. Suspicion attaches itself to each of the three localities admitted into my "Tentative List." Dr. Ralfs and Mr. W. Curnow had often explored every inch of the Land's End district, and were never able to verify Mr. Wood's record; and although specimens of most of the plants recorded from the Scilly Isles can be found scattered through the herbaria of the several botanists who have visited the Islands, nothing approaching *G. Vaillantii* can be found. The Cornish Moneywort Club's record also stands without confirmation. Evidence is strong against the plant occurring in any of the western counties. In a genuinely wild state, Essex is the only possessor of it.

Asperula cynanchica, Linn. Although the quinancywort ranges from South Devon to Norfolk, and from Glamorgan to Westmorland, more reliable information than we at present possess must be forthcoming before it can be accepted as a native of Cornwall. Judging from what I have seen of it in neighbouring counties, it is more or less a calcicole subject, and Corn-

wall offers little encouragement for such plants. In drawing up his list for Mr. Watson, Mr. Pascoe included *Asperula cynanchica* without being able to cite a single locality for it. Miss Moffatt is also unable to submit a voucher specimen for the "Common near Biscovey."

Filago apiculata, G. E. Sm. This must be deleted, Mr. Winn having recently assured me that he and another critical botanist have recently gone over his specimens, and they are both agreed that what were recorded as *F. apiculata* must go down as *F. germanica*. Mr. Richards' Poltesco record is not supported by specimens.

Hieracium crocatum, Fr. This is another case illustrating the value of voucher specimens. At my request Mr. Winn has submitted his Gwennap Pit specimen of what he has been calling *H. crocatum* to a specialist, who at once fixed it as a triflingly abnormal example of *H. umbellatum*. *H. crocatum* is distinctly a north-country plant, Merionethshire marking its most southern limit.

Cuscuta europæa, Linn. Adhering to the rule laid down at the head of this section, that every critical species recorded for Cornwall must be supported by voucher specimens, or have been checked or verified by another botanist, I must place the great dodder in the present list of exclusions.

Rumex maritimus, Linn. The remarks offered on the preceding species also apply here. There is an old Devonshire record for the plant, so old, in fact, and unreliable, that no use was made of it for the second edition of "Topographical Botany."

Poa Alpina, Linn. The only published Cornish record for this grass is for Eastern Green, Penzance, by the late Mr. W. A. Glasson, in the "Transactions and Report" of the Natural History and Antiquarian Society of Penzance, 1889-90. This, of course, is a native of the mountains of Scotland and the north of England, and one would as soon expect to find a Moa or a Dodo in an aviary as *Poa alpina*, growing on the sunny slopes of Mount's Bay.

NOTES ON THE CHURCH OF ST. IVES.

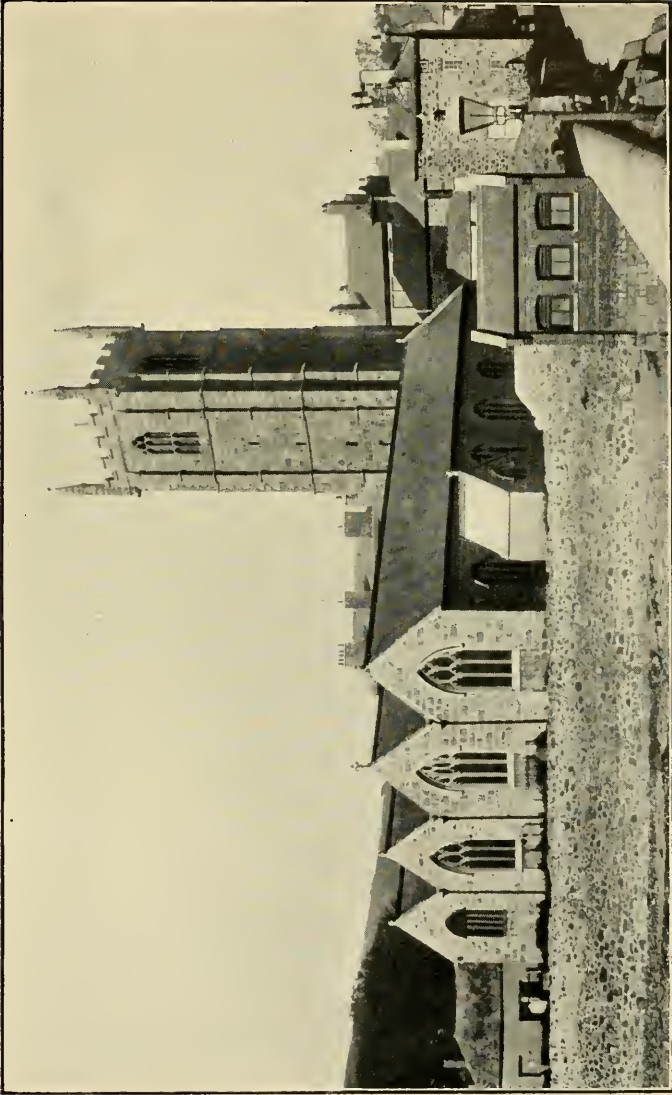
BY THURSTAN C. PETER.

Seen from the north-east or south-east, the features of this church that most strongly impress one are the courage of the builders who dared to erect four continuous roofs, without clerestory¹, of equal pitch side by side in a town where every other building is marked by its extraordinary irregularity; and the beautiful proportions of the tower which is 84 feet high to the battlements, of four stages, with buttresses of seven. The belfry windows are of three transomed lights, and much larger than is usual in Cornwall. The church now stands on the very edge of the water, on whose depths the majority of the worshippers toil for their daily bread, but tradition alleges that in the 17th century a field lay between the churchyard wall and "Porth Cocking" rock. The massive granite ashlar with which the rubble walls of the church are cased gives it a very heavy look in the eyes of a stranger, but a Cornishman, accustomed to see these great blocks even in cottages, sees in them when properly disposed only an added dignity.² The church has been partially restored more than once in recent times, first by Mr. William White (the man who removed the Norman work from Phillack), and lastly, in a more conservative manner, by that skilled ecclesiologist and architect, Preb. Hingeston-Randolph. It is now (1905) about to have its vestry enlarged, its recent chancel window made to match the beautiful east window of the Trenwith Chapel, and its seating rearranged, and floor relaid. The work is in the hands of Mr. E Sedding, and no anxiety need be felt as to the nature of the work to be done.

In the parish records of the 17th and 18th centuries we read of many repairs and additions, of injury by storms, and so on. Indeed much work was done in those centuries and a most careful record kept of it. In 1640, a gallery was erected in the tower-arch at a cost £41 2s. 0d., as appears from the borough

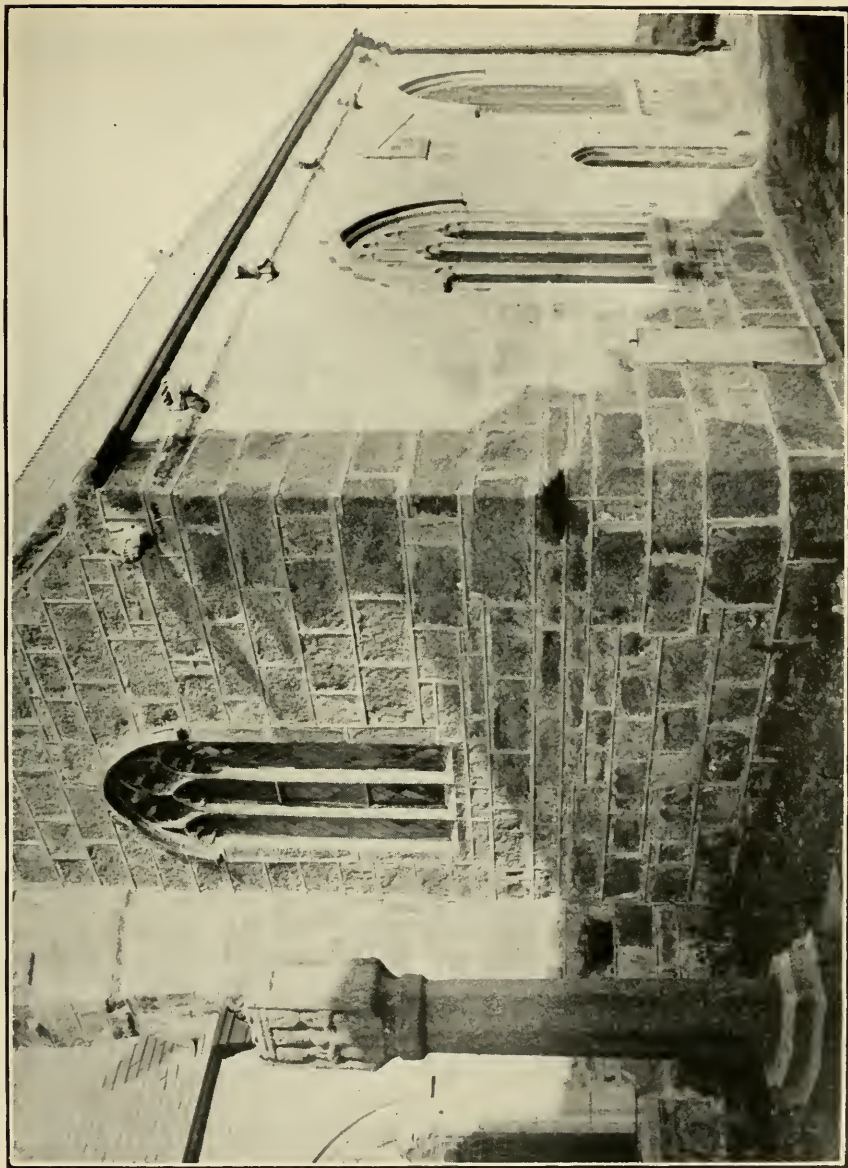
¹ The only clerestories in Cornwall (except in recent buildings) are at Callington, Fowey, Lostwithiel, and North Petherwin.

² According to tradition, the granite was brought from Zennor by water.



ST. IVES CHURCH FROM N.E.

[Photo by F. Frith & Co.]



CROSS, AND TRENWITH AISLE, ST. IVES, CORNWALL.

[Photo, J. C. Burrow, Camborne.

accounts. In 1853 the chancel was restored and the whole church reseated, the font being at the same time restored, a delicate operation performed with care, though it is probable that it is to this that we must attribute the doubt as to the reading of the legend on it. In 1887, the slating of the roofs was renewed throughout, and the panelling which had been of deal (covered with paper supposed to resemble oak, and varnished) was replaced by genuine oak, a good many old fragments being worked into it.

But through all its restorations³ St. Ives church has retained its original form to a degree that few churches have. A casual glance suffices to show that the main body of the edifice, the chancel, nave, tower and north aisle, are of the early 15th century, and that the south aisle and the chapel opening from it, usually known as the "Trenwith Aisle," are of later date, though probably erected in the same century. Its doorway (now blocked) under a square arch with quatrefoils in the spandrels, and its windows with cinquefoiled lights, are of the late perpendicular period.⁴ Around this aisle on the outside are some quaint corbel-heads, and a fine gargoyle, which are probably somewhat, though not much, older than the church, and perhaps came from the former chapel of Porthia. By the porch stands a fine 15th century granite cross (on a modern base) with battlemented top. On the western face the Deity is represented supporting in his arms Christ crucified, and in the top corners are two shields apparently blank; on the eastern side is the Virgin holding the infant Christ; on the south side is a bishop, in mitre and chasuble, and holding a pastoral staff, his right hand being raised in blessing; and on the north is a crowned female figure, possibly St. Ia.⁵

Within, the church presents the usual series of four-centred arches⁶ (of Beer and Pennant stone, some capitals being

³ The churchwardens' accounts and other books record many other details of alterations, repairs, &c.; indeed I know of no country church with so full a record, but I have not space for all the entries.

⁴ Mr. Sedding does not consider that this doorway forms a true part of the original structure. He is about to remove it to the west end of the chapel as an open doorway.

⁵ This cross is figured in Hingeston's (now Hingeston-Randolph's) "Specimens of Ancient Cornish Crosses, &c.," London, 1850, and in Blight's "Ancient Crosses of Cornwall,"

⁶ The nave arcades incline outwards to a considerable extent.

moulded and others carved), and except for its size—72 feet by 51 feet—⁷ and the exceptional beauty of its waggon roofs, is in no way remarkable. But it is nevertheless a church well worth a visit if only for the sake of its font and wood carving.

The arcades are well designed, and the wave moulding between the shafts of the piers that is carried up into the arches is distinctly superior in effect to the usual shallow hollow that constitutes the moulding of most Cornish piers.

The font is apparently of the 14th century, and, unless it is merely a copy, must have been brought from elsewhere, as St. Ives was not at that date licensed for baptisms. On the eastern side of the band that connects the four angels bearing shields, there is inscribed a legend, somewhat mutilated, but apparently “Oes (i.e. Omnes) baptisate gentes.” The beasts around the base (said to represent the evil spirits exorcised in baptism) should be compared with those on the base of the font formerly in Camborne parish church and now at Treslothan, and of the one at Crowan.

But the finest feature of St. Ives church is its 15th and 16th century wood carving.⁸ Not only is there some very beautiful old work left in the wall plates and in the roofs themselves, but the bench-ends are of exceptional merit, and different from anything else in the county. Tradition attributes these bench-ends, as also the rood screen (now gone,⁹ though perhaps it is a por-

⁷ These measurements exclude the tower and Trenwith chapel.

⁸ The late Mr. J. D. Sedding considered the St. Ives carving to show strong traces of Brittany influence, and the unusual number of Bretons who are shown by the Subsidy Rolls to have lived here in the 15th and 16th centuries, lends colour to this suggestion.

⁹ The following extracts from the borough accounts tell their own tale (1647-8) :—

“Received of Mr. George Hicks, being churchwarden, towards the charge in bringinge down the Organs, Raylinges and other Implements of the church, 18s.”

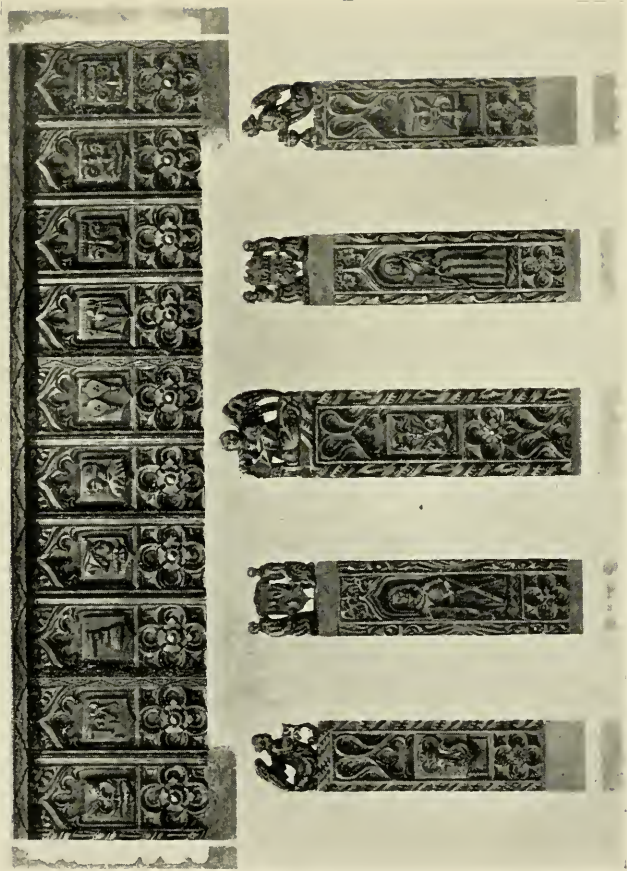
“More payd the Joyners for takinge downe the organs and Railings of the church, 51 15s. 7d.”

The plural “Organs” does not mean that there was more than one instrument. Hicks, in his MS. history of St. Ives (1722), says that this instrument was of unusual size for a 15th century one, that it cost £30, and was one of the first erected in Cornwall. He saw some of the pipes, a few of which were serving as water-spouts. The “railings” was the curt and inelegant name by which the Puritans described the rood-screen.

The carving of screen and sedile are far less bold than that of the pew ends, and it is very unlikely that they were by the same hand.



(Photo. J. C. Burrow, Camborne.
FONT, ST. IVES (CORNWALL).



ST. IVES CHURCH.—Benches.

From drawing by Mr. Newton Penprase, Redruth.

tion of it that has been worked into the low chancel screen recently erected and into a sedile now in the sanctuary of the south aisle), to Ralph Clies, a master smith, and points to the front panels of two large seats (now in the choir, but formerly at the west end), on which are sculptured hammer and anvil, pincers, a horse-shoe, nails, bellows, a ladle and other implements of the smith's craft, as having reference to him, and to a man's and woman's heads on two of the panels as the portraits of himself and of his wife. This is mere fancy; and it is, moreover, a distinct breach of the wholesome maxim "*De mortuis nil nisi bonum*" to mistake for him the jester, and for his wife a woman, on every line of whose ill-tempered face is written in unmistakable characters "*The village scold.*" This does not, however, disprove the tradition that we owe these exquisite carvings to the generosity of Ralph Clies. In the list of inhabitants of the neighbouring parish of Zennor taxed to the subsidy of 1571, we find this name, standing, perhaps, for a descendant of the benefactor of St. Ives church. Quite the best wood-work is found in the eastern standards of these same benches, and of two others adjoining them, the figures of St. Andrew and St. Peter,¹⁰ and those of the two angels kneeling, one holding the pyx, being especially fine. They are probably portions of the old stall-desks in the chancel. Above the panel of St. Andrew are two clerks supporting the arms of the Peyn family (in a plain field, three pine apples, and an arrow head in pale reversed), and above that of St. Peter, two other clerks supporting a shield on which the name of John Peyn is inscribed. One John Peyn (or Payne), no doubt one of the family just named, was the unfortunate portreeve of St. Ives, who was hanged by Sir Anthony Kingston, the provost marshal, for his share in the Cornish

¹⁰ Matthews in his *History of St. Ives* (London, 1892) states that at the consecration of the church on the 3rd of February, 1434, St. Peter and St. Andrew were added as patrons. We do not know the authority for this statement, and believe it to be an error altogether. Bp. Lacy (Regr. ii. 21) in a document dated at Penryn, 18 March, 1431, refers to St. Ives church as "*the chapel which we have lately consecrated*" *sane, cum nos, nuper Capellam Sancte Ye Virginis de Porthia . . . rite et libere fecerimus consecrari*, and the church is called in the Registers "*St. Ives*" (St. Ia) up to the end of the 18th century. It is, however, at present known by the name of St. Andrew, though when first so called we are not sure. St. Andrew's Street, close by, bore that name in 1780.

Some of the benches are illustrated in Hingeston's *Specimens of Ancient Cornish Crosses, &c.*

“Pilgrimage of Grace” of 1549. According to tradition, the provost carried out the execution with the same brutal levity that is attributed to him in the legends of other places, first dining with his victim, and then hanging him in the street before the door. In the south aisle was, until 1898, a bench-end surmounted by a very spirited representation of an angel kneeling at a low desk on which he supports a book. This bench-end was formerly in the chancel, and has again very properly been placed there. One of the western standards on the south side side has a spirited representation of a jester. The pulpit is made up of carved panels from the old benches.

There is a pre-reformation monument in the church, or, rather, the fragments of one, formerly on the chancel floor, but now mounted on a slate against the southern wall of the Trenwith aisle. The figure of Otho Trenwyth is missing. St. Michael has been placed in a position that is ridiculous, in view of the fact that the lady is addressing him in prayer, and whoever “restored” the brass mistook the nimbus for the outline of his head, thereby producing a most extravagant grotesque.¹¹ On a scroll at the top we read “Sĉe Micaell ora pro nobis,” and at the foot is the inscription “Hic iacēt Oto Trewnwyth’, Generosus, q’. obijt die dñica px’ ante festū purificacōis bĉe marie virginis. A.º regni Reg’ Edwardi. iijjti. sĉdo q’ fuit vir benign’ deo et mundo ac bene disposit’ Et dña Agnes Consors ei’ quorum aĩabz ppiciet’ ds,” that is “Here lie Otho Trenwyth, Gentleman, who died on the Sunday next preceding the Feast of the Purification of the Blessed Virgin Mary in the second year of the reign of King Edward IV. [1462], and who was a man acceptable to God and to the world, and well disposed, And Dame Agnes his wife, on whose souls God have mercy.” It is probable that Otho Trenwyth was the builder of this chapel.¹²

On the western wall of this aisle is a slate tablet in memory of “Four hopeful sons a grandsire and a maid” as the very

¹¹ The figure of St. Michael is 11½ inches in height; that of Dame Trenwith 16¼ inches. St. Michael’s head *as restored* measures 2½ inches across.

¹² For an account of the manor of Trenwith (in Domesday, Trenwit) and of the family of that name see Matthews’ History of St. Ives, London, 1902. In 1898 many of the carved benches formerly in the Trenwith Chapel were removed to make room for a side altar, then in course of erection, and these benches have now been placed in the nave.

artificial verses inscribed inform us, though the legend along the sides reads "Here lyeth ye bodyes of Alse Sise and John Sise, Ephraim Sise, Mary Sise and Ephraim Sise. Alse Sise buried ye 16th of Auguste 1642," and on one side the transposition "Allee Sise, ills cease." Close by this monument is the entrance to the roodstairs, the external projection of which may be seen in the angle formed by the Trenwith Chapel wall with the porch. This projection is locally known as the "Organ Tower," no doubt a recollection of the time when that instrument had taken the place of the rood.

In the south aisle is a wooden memorial of Ann, the wife of John Stevens, of Trevalgen, who died 15 September, 1729, aged 23. It is vulgar and ugly even in comparison with other monuments of the same date.

There are no traces in this church of old stoup, piscina or credence,¹³ though perhaps further search might reveal them.

There are doorways in the west face of the tower, through the south porch, in the west wall of the north aisle (a most unusual feature) a low doorway (lately raised) at the eastern part of the north wall and in the south wall of the Trenwith Chapel (blocked).

On the south side of the east wall of the north aisle is a low arched recess, the purpose of which we do not understand. It is certainly not a door; and it has been suggested that it is the entrance to a vault.

Another feature of this church that is at first puzzling is the position of the tower arch which is very much south of the centre of the west wall of the nave. On the eastern face of the tower there was found during the re-roofing of the nave an incised line, showing that a former roof had had its apex immediately above the tower arch. The church apparently at one time consisted of nave and north aisle; and there may also have been a south transept. When the south aisle was built it was no doubt discovered that there was not sufficient space for the purpose, a difficulty that was overcome by narrowing the nave, with the necessary result of disturbing its symmetry in the way named. Other evidence of the want of space is to be found in the facts

¹³ The present small bracket credence in the chancel is recent.

that the south wall trends northward towards the tower end, and that the south west angle of the south aisle is cut away so as to avoid encroachment on the narrow street outside.

There are only two bells in the tower, both dated June, 1830, one with a diameter of 36 inches at the mouth, the other with a diameter of 48 inches. These are said to have been cast from the metal of five older ones, one bearing date 1721. The Terrier of 1746 says "There are three Bells in the Tower."

There are a few fragments of glass in the windows of apparently early date, but the colouring in the few windows that are so filled is modern, and for the most part good neither in design nor tone. The chancel window till recently represented our Lord, St. Andrew, and St. Peter. The parish accounts say "The window over the altar was rebuilt and filled with new glass of beautiful design in the year 1852, at the cost of H. L. Stephens, Esq., and Mrs. Davy." So says the record. Those of us who remember the window can only be grateful for the explosion at the Hayle dynamite works, January, 1904, that blew in a great part of this window, and can only regret that its effects did not extend further and destroy also some other glass in this and the neighbour church of Lelant. The parish now has a reasonable excuse for destroying what is left, and placing a properly designed window in its place; and this, we are informed, is to be done. The window (by Messrs. Fouracre and Watson), placed in the south aisle in 1885, in memory of John Newman Tremearne and Matilda, his wife, by their children, has pictures of St. Sennen, habited as a bishop, St. Ia, and St. Levan, the latter with a fishing net, when we should have expected the hook and line which tradition usually attributes to him.

The 'Resurrection' window in the Trenwith chapel, by Messrs. Heaton, Butler and Baines, is not worthy of that firm's reputation either in design or execution.

The best window in the church is in the south aisle near the font. It is the work of Mr. Powell, of Whitefriars, the subject being the Three Christian Graces, and is to the memory of Dr. and Mrs. Yonge. It is by no means a perfect work, but it is difficult to believe, though it is the fact, that the same

maker is responsible for the crude colouring and bad drawing that disfigure the east window of the north aisle. This latter window and others in the church have the defect so common a few years ago, the result of trying to make a picture on as large a piece of glass as possible, instead of a rich mosaic broken up by irregular leading.

The church plate is good, one of its most interesting vessels being a large paten (bearing the mark of John Martin Stoker and Edward Peacock, as makers, and entered in 1705) inscribed "Pendarves de Pendarves Ecclesiae dedit anno 1713," and engraved with the Pendarves crest. It weighs 15 oz., 5½ dwt.

According to the churchwardens' accounts of 1650, there were then "Two silver flagons holding above a pottle each," the gift of Grace, widow of Lewis Hurley, of St. Ives, Vintner; and "two silver cups with covers." One of these cups is inscribed "The guift of Alles Sise To the Church of St. Ives, Anno Domini 1641." It has a cover inscribed "St I." on the foot. It is now used as a paten. The other cup appears to be Elizabethan, but is not of the best design of that period. The two silver flagons are still preserved. Each is 14 inches high and 7¼ inches in diameter at the base and weighs 59 oz. 5 dwt. The date mark in each is 1640 and the maker's mark 'L.M.' over a pig. There are also a paten without foot, weighing 12 oz. 7 dwt., and inscribed "H. R. K., 1675," date mark 1675, maker "E.G."; two alms basins with handles weighing each 9 oz. 5 dwt., of Exeter make, entered 1743; silver handled knife and fork, weighing together 9 oz. 2 dwt., without date mark, but probably those referred to in the churchwardens' accounts as follows: "1743. To Mr. John Boutett for a knife for cutting the Sacrament bread with the Postage, &c., £1 17s. 1d." In the same accounts we find: "1744. To Mr. Boutett for two silver basins to collect offerings, £7 1s. 10d.," these basins being evidently those above mentioned.

The vessels now in use are recent (1903) but very beautiful, the chalice being a replica of the celebrated chalice at Nettlecombe, Somerset, dated 1479, and the paten a shallow one, almost entirely plain.

The following from the churchwardens' accounts gives a list for the date referred to: "1776, March 27. Account taken by Hugh Mulfra and delivered him by Mrs. Symons, the church plate belonging to the church of St. Ives as under: One Platt and Salver. Two large Calless. One large and small cup with covers. Two collecting plates with Handlins. Kniff and Fork, one baskett. Deliver'd to Mr. Hicks ¹⁴ by Mulfra." In 1746 (as we learn from the terrier of that year) the Communion plate consisted of "two large silver flagons with the letters engraved on the handle of them G.H., weight of both 119 oz. 10 pwts.; one silver salver with the arms of Sir William Pendarvis, Knt.; and this inscription 'Pendarvis de Pendarvis ecclesiae dedit anno 1713.' weight 15 oz. 6 pwts.; one large silver chalice with a cover on the chalice with this inscription, 'the guift of Alles Sise to the church of St. Ives, anno Domini 1641,' and on the cover are these letters, St. J., weight of both 24 oz. 17 pwts.; one small silver Chalice with a cover on which are these letters, I.H S., weight 12 oz.; one large silver plate with this inscription, H.R.K., 1675, weight 12 oz. 7 pwt. Two silver basons for collecting alms at the Communion, weight of both 18 oz. 11 pwts.; one silver hafted knife, for cutting the Sacrament bread."

The terrier of 1746 tells us that there was in the church "one Book of Bishop Jewells works fol. with a desk for it to stand on."

The early church history of St. Ives is very obscure, as might be expected from the fact of its having been merely a chapelry dependent on St. Uny Lelant. In the *Inquisicio Nonarum* of 1340 the church of Lanant and chapel of St. Hya are assessed together at £11 6s. 8d. On the 9th of August, 1331, the parishioners of this chapel obtained a licence for the celebration of Divine Service, conditional on the profits of the parish church of Lelant not suffering. On 3 January, 1384, the chapel was again licensed. On the 3rd of May, 1400, licence was again granted for this chapel of St. Ives (Sancte Ye, Virginis).¹⁵ In 1409, Peter Pencors, William Stabba, James

¹⁴ On the terminals of the square label of a mullioned window part of the ruins of a fine house still standing in a side street off the Digey, are the initials, 'G.H.,' probably those of George Hicks, churchwarden in 1636, and no doubt of the same respectable family as Mr. Hicks named in the text.

¹⁵ Regr Stafford 1, 39b.

Tregethes, John Guvan, and other parishioners of the chaperies of St. Tewennoc the Confessor [*hodie* Towednaek] and St. Ya the Virgin, complained that they lived for the most part, four, three, or at least two miles from the parochial and mother church of Lelant, the roads being mountainous and rocky, and liable, in winter, to sudden inundations, so that they could not with safety attend Divine Service, or send their children to be baptised, their wives to be purified, or their dead to be buried; the children often went unbaptised, and the sick were deprived of the last sacraments. They stated that they had built these two chapels at their own expense, and enclosed suitable cemeteries, intending to sufficiently endow them for two priests to serve therein, and they prayed the bishop to consecrate the same, who accordingly commissioned Richard Hals, treasurer, and John Gorewyll, canon of Exeter, to meet all the parties, including the petitioners on the one hand, and John Clerk, the vicar of Lelant, and the parishioners of that parish, on the other, and to inquire and report on the question of the consecration of these two dependent chapels.

It is clear that in those days a matter of this kind was not hurried over without careful inquiry and apparently a good deal of "red tape." On the 8th of September, 1411, we find two of the petitioning parishioners, Peter Pencors and John Guvan, attending at the bishop's palace at Exeter, and presenting him with two bulls of Pope Alexander V (ob. 1410), dated the 28th of October, 1409, and of Pope John XXIII, dated the 18th of November, 1410.

These bulls (which are set out in full in Bishop Stafford's Register) authorised the dedication of the dependent chapels of St. Tewinnoc and St. Ya, and the erection of fonts, and the celebration of mass, &c., therein, if the bishop of Exeter, after due inquiry, should find the facts to be as stated in the petition, saving, nevertheless, the rights of the said church of Lelant and of all persons interested; and the petitioners prayed and even insisted that full effect might be given to them, urging again the inconvenience already set out. They desired that fonts should be placed in these chapels and the sacrament administered therein, and that the cemeteries should be licensed for interments. The bishop ordered that inquiries should be made, and that if

the results were satisfactory the petition should be granted. The second bull refers to a dispute between the parishioners and John, the vicar of Lelant. The bishop directed the precentor and chapter of Crediton, rectors or proprietors of Lelant, and the vicar, in especial, and all others interested, in general, to appear before him personally in the church of Crediton. Shortly afterwards we find the bishop in Cornwall, and, the enquiries having evidently proved satisfactory, on the 9th of October, 1411, at "Lananta" he granted his licence to celebrate Divine offices in those chapels, during pleasure, and without prejudice to the rights of the mother church.¹⁶

The construction of the licence granted to St. Ives seems to have been a source of much litigation and ill-feeling. In Bishop Lacy's register (ii. 21) is a copy of a long decree of the bishop, dated from Crediton, referring to it. The bishop commences by an expression of regret at the habit men have of perverting the meaning of words that are really quite plain, and waxes indignant over this evidence of man's depravity. He recalls the recent consecration of St. Ives chapel, saving ever all accustomed rights of the parish church of St. Euminus, and complains that, nevertheless, some of the parishioners of the said chapel of St. Ives impudently presumed to assert that mortuaries of which the said parish church of St. Euminus had been from ancient times in peaceable possession, since the consecration of the said chapel, neither belonged nor ever could belong to such church, because in the ordinance recently made on the occasion

¹⁶ The phrase "Mother Church" originally meant the minster church, entitled to tithes, the oratories on private estates, now known as parochial churches and chapels, not being so entitled. From the earliest times the interests of the mother church were carefully protected, not only in the matter of repairs, but especially of tithes and offerings. In King Edgar's ecclesiastical laws of the year 958 we read: "This is the principal point, that God's churches have their right, and that everyone pay his tithes to the ancient minster to which the district belongs. . . . If there be any thane who hath on his bocland a church with a burying-place belonging to it, let him pay the third part of his tithes into his own church. If he hath a church with no burying-place belonging to it, let him give his priest what he will out of the nine parts, but let every church-shot go to the ancient minster from all the grounds of the freemen."

In the time of Henry I we find the minster still called the "mother church," and the parochial church with a burying-place called the "parochial mother church." The distinction between church and chapel involved great variety of privileges. The penalty for laying hands on those going to them varied from 100s. in the case of a mother-church to 10s. in case of a chapel. See hereon Rev. O. J. Reichel in *Trans Devonshire Association*, vol. xxx, pp. 269 sqq.

of the said consecration, there is no special mention of mortuaries as due to the said parish church. As a matter of fact, there had been, during the time of Bishop Stafford, litigation in the Consistory Court, concerning such mortuaries, between the parishioners and the then vicar, when it had been definitely adjudged that mortuaries, in the form and manner described in the sentence were, by virtue of ancient custom, thenceforth due and should be faithfully paid for all and every of the parishioners of the said church and chapel dying in the vill of Lelant (Trembethow Hall, Bronyone, Polpere, and a house called Porthya New Hall (Nova Aula de Porthya) alone excepted). The bishop then sets out the words in his ordinance that were alleged to be ambiguous, and as to which the dispute and litigation had arisen: "Saving fully and for ever all parochial rights, by common law or custom, of the parishioners of the said parochial and mother church of St. Eunninus, and of the vicar thereof for the time being, in and from the said chapel and its parishioners"; and being urged, as he states, by Sir Richard Tresaghere, vicar of the said parish church of St. Eunninus, in person, as well as the parishioners of the said chapel of Porthya, by Peter Pencors, their proctor properly constituted in writing, attending before him at his court at Crediton on the 28th of July, 1432, to explain the ambiguous words, and they having undertaken to accept and obey his decision in all respects, he accordingly declares that by ancient custom in force prior to his said ordinance, and by the force of the ancient constitution and by the authority of the definite judgment referred to above, mortuaries were due and payable by the parishioners of the said parish church of St. Eunninus and of the said chapel of St. Ives (Sancte Ye); that he had never intended by his consecration of that chapel in any way to derogate from the right and ancient customs of the said parish church of St. Eunninus, but to prevent future trouble he declares his interpretation of the words alleged to be ambiguous to be this: That mortuaries, in the manner and form in the said judgment described, and confirmed by the long standing custom of the parish of St. Eunninus and of the chapel of St. Ives, should for the future be faithfully accounted for and paid, any verbal obscurity or ambiguity respecting them notwithstanding. Though some had endeavoured to cast doubt

on the intention of his said ordinance, the chaplain of the said chapel of St. Ives (to be maintained at the cost of the parishioners of the said chapel) might celebrate the Divine offices in the said chapel at the expense of the parishioners thereof and might administer the sacraments and sacramental rites belonging to such parish to the parishioners of the said chapel, in health and in sickness, as well without the said chapel as within, and might say and celebrate and officiate at the Divine offices within the said chapel and without it, for the quick or the dead, and discharge all other the lawful and customary duties of a parish priest. Provided always that within the said chapel and without the same, the vicar of the parish church of St. Euminus for the time being should at his free will be at liberty, personally or by another, to discharge the said duties towards the parishioners of the said chapel. As to the mortuaries declared to be due to the vicar of the parish church, and illegally withheld from him, the offenders are to be warned in the said chapel, or in the parish church, on some feast day, to make restitution to the vicar within fifteen days, under pain of the greater excommunication.

Then follows the appointment of Peter Pencors as proctor for the parishioners of the chapel having cure of souls and for the whole parish commonly called St. Ives. It is a very full authority, but its contents are of no especial interest except to a lawyer. It is certified by the seal of the official of the peculiar jurisdiction and dated at Penryn on the 18th of March, 1432.

Much of the history of St. Ives can only be conveniently told in connection with that of the mother church of Lelant. I ignore accordingly the appropriations to Tywardreath and Crediton, the dealings with the rectory at the time of the the Reformation, its leases, &c., and only note what is peculiar to St. Ives.

Matthews, in his History of St. Ives, says: "When the present church was built, early in the fifteenth century, the relics of the patron saint were translated to a beautiful Shrine in the chancel, but at the Reformation this was destroyed, and Saint Ia's remains scattered to the four winds. The chapel of Saint Ia was, it appears, altered or added to long after its erection, for it is known to have possessed Norman architectural features." If

this is true, it is interesting, but unfortunately Mr. Matthews gives no authority for his statement, and we have failed to find any. During several years of the Commonwealth one Leonard Welsted¹⁷ resided in the town, and served as minister, and on the 1st of February, 1653, married Grace, one of the daughters of John Trewynnard, gentleman, by whom he had children, whose names appear in the parish register. His name appears several times in the borough accounts, as for example, under date 1649, "Pd Mr. Welsted for Medsummer an. gr. 1649, £3 10s. 0d.;" "Pd Mr. Welsted for a sermon All Saints day, 10s.,"¹⁸ and in 1652 "Payd Mr. Leonard Wellsted, Minister, £1 and is for the interest of a sum of monie given as a Legacy by Mrs. Chestian Hext unto the Minister of the parish to be payd for ever for him in full being due at Candlemas last £1 0s. 0d." ¹⁹

The registers commence in 1651. Few parishes have more interesting records than those contained in the St. Ives registers, churchwarden's accounts, and borough accounts²⁰. Very full extracts have been printed from them by Mr. J. H. Matthews in his "History of St. Ives, Lelant, Towednack, and Zennor"

¹⁷ Matthews (St. Ives, &c., p. 221 states that Welsted was ejected from his living in 1648 for non-conformity, but does not state where the living was from which he was so ejected.

¹⁸ Note a sermon on this day in the middle of the Rebellion. The Puritans did not, as is often supposed, altogether discontinue the ancient names of the feast days. Thus is a deed of 1656, drawn up by the Commissioners of Cornwall for the sale of the royal manors "Ascension-day" is so named (Revd. S. Rundle in Journal Penzance Nat. Hist. Socy., vol. 2, p. 345.)

¹⁹ The name Hext, which is frequent in the early records of St. Ives, disappears after the Commonwealth. The payment was refused by the mayor and corporation from the year 1869 to 1879 inclusive, when the late vicar, revd. J. B. Jones, made his claim in the Penzance County Court, and on 11 August, 1880, the judge, Mr. Montague Bere, Q.C., stated "This is really an undefended case, and to my mind it is not the most creditable thing for a body of public men to resist an honest demand of this description. I give judgment for 6 years" (since the statute of limitations was pleaded) "£6 with full costs." Leave to appeal was refused, and one month allowed for payment. This foolish action on the part of the authorities cost the ratepayers a considerable sum of money. The terrier of 1746 shows us that the surplice fees payable to the vicar of Lelant from St. Ives were the same as from the mother parish except that there was in addition "for a mortuary ten shillings due for every person who dies worth £10 or upwards And £1 per ann. for ever paid to the vicar by the mayor of the said borough for the time being for a sermon to be preached yearly on the day of his election, it being the gift of one Mrs. Cheston Hicks." This, of course, must be the same person. We note that the terrier is signed by (inter alios) "Wm. Symonds, mayor and vicar."

²⁰ Hereafter occasionally referred to as R., C.A., and B.A. respectively.

(London, 1892), a work of considerable interest, though requiring to be used with great caution. From these records I make a few extracts :—

(B.A.) 1573 Received of John Clarke for the enterlude
£1 0s. 11d.

Received of Wm Trinwith for sixe score & thre foote of
elme bordes in the playing place, 6d.

Rec. of the Kinge & Quene for the somer games
£1 0s. 4d.

(B.A.) 1575 (?) Received the firste day of the playe 12s.
[On the five following days the total receipts amounted
to £14 4s. 8d.]

More received for drinke monye w^{ch} añ 1s. 2d.

More received of William Trinwith in the Church yeard
which amountethe to £1 16s. 2d.

More received for drink money after the playe 2s. 8d.²¹

Received of James Huchine for the somer games 14s. 6d.

Although there were a few payments to be made, as to “the pypers for their wages” and “to William Barreat for 13 pound of hops” and “to John Goman for a barrell of drink, 4s.,” yet the profit must have been considerable. Amongst the payments we find a startling one, —

“Item, spent upon the carpenters that made hevin 4d.”

What orders of councils and monitions of bishops could not effect, the Puritan feeling of the people themselves at length brought about. In 1640 (B.A.) occurs the last reference to these popular pleasures at St. Ives, whether in the churchyard or elsewhere. “Item, more received from the Lord and Ladie last yeare past, 8s.” The borough accounts of St. Ives give some interesting illustrations of the custom of covering the church floor with rushes and such things.

²¹ The comparatively small sum received for “drinke” is noticeable. The supply of refreshments was no doubt customary. The Cornish Miracle Play “Beunans Meriasek” (a life of the patron saint of Camborne church, the existing copy of which, as its colophon informs us, was completed in 1504), closes with an invitation “Drink ye all with the players we beseech ye before going. Piper blow at once. We will go to dance. Go ye or stay, welcome ye shall be, though ye be a week here.”

(B.A.) 158(0?) Item, furste payde for X horses to carye morash Russches frome Connerton gevyn unto the paryshe church of Sent Yves Yerlye by Sr John Arundell of Lannhern, Knygth & hys awncetors tyme owt of mynde, & ther labours that gatheryde the same Rusches, 5s. 8d.

(B.A.) 1594 Ite' delivered the churchwardens to buy rushes 6s.

(B.A.) 1596 Itm pd for too packs of Russches agenst Cristms 16d.

The use of rushes, especially at Christmas time, survived the introduction of seats. The latter were at St. Ives, as elsewhere, a source of anxiety and vexation. "It is agreed upon this daye of Marche, Anno 1592, by the whole xij men and xxiiij whose names hereunder are written tuchinge the graunte and settinge of all the chaires w^{thin} o^r churche of St Yves for the maintayninge and repayringe both of the Churche and Churche Yearde Wale, the key and other nedefull business w^{thin} the same towne and parishe. In primis we have consented and agreed thatt every man and woman shall inioye and use the sayde chaires during there naturall lyves, accordinge to a booke thereof made, and rated, whereunto o^r hands are subscribed, and thatt the sayde Rate be of every one payde q^rterly and for default of paymentt to be in the hands of the parishe againe, to be sett att the moste profit." In due time the abomination of pews was introduced.

(B.A.) "1614. The Porthrive and the greateste number of the xij, with the goode lykinge of Mr. Pestle our vicar, do agree and give their consent that Mr. Celye [William Celye, gentleman, one of the xij] shall have, sitt in, and enjoye, as well by himself, his familye and frindes, a fitt and necessarye place to make either pewe or pewes in the Sowthe parte of the middle Chauncell, where the organs be, so as the said William at his own coste shall buylde and make up the same."

One entry in the Borough accounts of the year 1596 is perhaps worth noting. "Pd to 3 women to watche the corps

that night, 12d. Pd to the olde vicar²² for candells bread and drinke for the watchers and other dewtyes dew to that Vycker, 16d."

On the 1st of May, 1629 (B.A.) the portreeve and "twelve men" of the parish met to consider the question of tithes, as to which a dispute had apparently arisen, and agreed "that they will be att the joynt cost in defending the same custome or customes, or for any other customes within the said parish," and on the 7th of the same month "the Porthreife and others of the xij then present doe agree and order that whereas there is a suite of Lawe dependings in the Courts of the Archdeconarie of Cornewall between Mr. John South, vicar, [of Lelant], and Richard Hicks, Thomas Trerie and Frauncis Walker, for the tyth of Kyne and Calves, wherein wee labour to maintaine the auncient custome, to pay 4d for ech cow and 2d for ech calfe under the number of fower, w^{ch} alreadie amounteth and will cost much monies for the defence thereof," the market-house shall be let for a year and the rent applied to the defence of these parishioners. On the 25th of the same month, Richard Hext, the portreeve, and eight others signed an undertaking to pay the charges of any parishioner who should be sued for any higher sum than allowed by the said custom.

In 1711²³ the earl of Stamford and others, as impropiators of the tithes, were at law with some of the fishers. The witnesses generally agreed that tithes were payable, but there was a question as to whether a boat arriving from Ireland in the night was bound to give notice to the proctors to attend and receive their tithes. One witness (John Stevens, of St. Ives, merchant, aged 60), described the method of laying out the tithes as follows: "The usual way of giving out the said fish and the tyth thereof was after this manner, to witt, the fishermen on board the said boats filled up about 100 or 200 in a baskett, and delivered out in such basketts unto and among the owners of such fish according to their respective shares and interest therein, and when the tenth baskett came to be delivered the fishermen called out "Deka, Deka,"²⁴ and the proctors or agents for the

²² John Bagwell was inst. vicar 13 July, 1596, on the death of Robert Stowford.

²³ Exch. Deposition by Commission, 10 Anne, Easter, no. 6, Cornwall 1711, quoted by Matthews, History of St. Ives.

²⁴ Deka is Cornish for tenth.

said tyth generally attended and took and received the same." Fish titles were peculiar to the west of England and Yarmouth, and perhaps a few other places. Canon Hammond in "A Cornish Parish" (London, 1897) prints extracts from the tithe account of the vicar of St. Austell, extending from 1598 to 1620, from which we learn that the fish-tithe in that parish was usually compounded for and paid in money.²⁵ In "Odd ways in Olden days down West, or, Tales of the Reformation in Devon and Cornwall," by the rev. Herbert Reynolds, priest-vicar of Exeter (Birmingham, 1892), a very interesting volume in spite of its flippancy, may be read many interesting disputes that came before the consistory on the subject of tithes. In Knox's History of the Reformation is recorded the case of a fisherman, named David Straiton, who, having been required to pay tithe, said that, if the priests would rob him, they might fetch their tithe for themselves, and, as each tenth fish was caught he threw it back into the sea. He was excommunicated for his disrespect and burnt. A somewhat similar dispute arose as to the tithe of milk at St. Mewan in 1749, when Edward Carthew, the rector, brought his bill in the Exchequer against one Edwards who, when the rector refused to fetch the milk, and insisted that it should be brought to him, gave orders that "every tenth meal of his cows be turned upon the ground." The Court decided that the farmer must milk the tenth meal into vessels of his own, but that the rector must fetch it in vessels supplied by himself.

Lord Cowley, the present impropriator, receives about £350 a year from the parish in lieu of the tithe on the fish. He also receives £175 out of the commuted tithe, the remaining £185 being paid to the vicar of Lelant.

In 1826 St. Ives was augmented by Q. Anne's Bounty, and thereby became a perpetual curacy by virtue of I Geo. I, chap. x. There is no record of this in the registry at Exeter, to which fact it is perhaps due that this partial separation from Lelant is ignored in more than one official act subsequent to 1826. It is now by virtue of a recent act a titular vicarage.

It is interesting to find that the dislike of Sunday fishing, of which in 1896, during the Newlyn riots, a local preacher naively

25 For the custom at St. Goran see Peter's History of Glasney College.

remarked that "it is wicked, and besides, it injures the price," is by no means a modern growth. An entry in the borough accounts for 1622 reads "It is agreed by generall consent, that hencforth no owner of boats or netts shall dryve or sett their netts or owner of Seanes row to Steame (Stem), the Sondaye nights, or any tyme before daye of that nighte: who shall herein transgresse, ech owner shall paye for his defaults 10s., and ech fisherman 3s. 4d., to be levied of their goodes for the use of the parishe." In 1626, Mr. John Paynter paid 2/6 "for the faults of his servants in shippinge their Sayne boates before daye on the Sunday night" and Henry Bailie paid 15/- for his offence, in company with five others, of setting nets at the same forbidden hour.

Another fact learnt from the borough accounts is that the churchyard was at one time fortified. Under 1573 we find "Rec. of Thomas Stevin and Thomas Hickes for there full and laste paiment of the benevolens towards the churche yarde vj^svj^d" Amongst the old documents copied by Mr. Hicks into the borough accounts are some dated about 1696, and referring to this subject. The payments of the "cute for resystans of the Enymye for fencyng of the church and Cr[enelling?] of the cherche yerd."

Another of these runs "It is ordred and agreed by the consent of the 12 men and the 24, Thomas Hicks hed wardeine, the 3 day of 1596 that the cute and rate made through the hole towne and p'ryshe of St. Yeas in anno 1595 was afr the attempt made by the Spanyards upon Mowsholle Newlyn and Penzans: . . . the which cute and rate is pd of many goode, well wyllers to our commonwealthe; . . . and the reste that hathe not pd the rate layd upon their severall and partycular hedds (in so dangerows a tyme) beyng lafullie sought and demanded to so goode uses as aforesaid as a token and a syngne that shewethe ther carles [careless] harts and hedds for to resyst that Enymye which thretned the Rewyne of our towne; and for that our churche windowes and church yard lyethe greatly in decaye at thys instant," therefore, payment of the cute is to be enforced, and the money is to be devoted to the repairs of the church windows and yard. In the 1596 accounts

is "To the great pice ordinance in the churche yard: and for the Makyng of the spange for the trap and churche Style vij^d"

In one of the years between 1573 and 1578 (the exact date is torn off), is an entry in the borough accounts:—"Thomas James, Pearse Nole, Churche wardens: whose yerely office i . . . d the better maynteynance and also, the laws of the Reallme dothe alowe and admytt: yt is Inacted: . . . of the Realme that the churge wardens shall yerely gay^r [gather] of every howssolder w[ithin] townes and paryshes: for the provydinge yerely of bread and wine for the Communion the value of their churche loaffe: or 4d. for the same, all grants, all quystts and bequethes: as also all sylver and lyberty to sell brew for the which the towne paythe, Yerlie for this William Teague } liberty, to the wardens of the market house Martine Goodall } due 7s."

The exact meaning of this is not clear, but it appears that every householder had to contribute 4d. yearly towards the cost of bread and wine for the Communion. This was then a far greater source of expense than now, owing to the fact that every one of sufficient age had to communicate. The following extracts from the churchwardens accounts are of interest:—

"1741 To Wine £7 6s. 2d."

"1743 To Wine for the Sacrament, &c., at 10s. per gallon, £5 4s. 0½d."

The "&c." here is suggestive. It was probably not all consecrated, and would be dealt with in accordance with the rubric. "If any of the bread and wine remain unconsecrated, the curate shall have it to his own use," or, perhaps, it was used for the sick poor. The terrier of 1746 tells us that the church furniture then included "Two dozen of quart bottles for holding and carrying wine for the Sacrament, on each a stamp Church St. Ives."

"The Sacrament of the Lord's Supper hath been administered six times—for which had Bread, five 9d. loaves and one 12d. loaf at Easter, 4s. 9d."

"For the aforementioned Sacraments were used nine gallons comes to £3 14s. 6d."

The only other extract from the borough accounts I need make for my present purpose is:—

“1604–5, Pd for the King’s Armes in the Churche 16s. 4d.”

Opposite the church porch is a refreshment house of evidently great age; Matthews (Hist. of St. Ives) states that this was the parsonage, but, *more suo*, without citing any authority. The present parsonage house (or vicarage) was erected in 1840, and paid for by subscriptions, a list of which appears on a tablet in the tower.

There seem to have been several chapels and oratories in this parish, some of which have survived into modern times, though no longer used for worship.

1. The chapel of St. Nicholas on the top of the island was, until recently, used by the War Office as a storeroom, but had been, from time to time, so altered that but little of the original structure remained. Its recent demolition by the War Office led to an outbreak of quite justifiable local indignation. This chapel is referred to by Leland, Tonkin, Hals and other historians, and in the *Liber Regis* is described as “St. Nicholas, chapel to Uni Lalant.” Holinshed (1586) says “There is at the verie point of the said Pendines a chappell of St. Nicholas, beside the church of St. Ia, an Irish woman saint.” Tonkin is, no doubt, speaking in his usual loose way, when he says, “On the island (or peninsula), North of Saint Ives, standeth the ruins of an old Chapel; wherein God was duly worshipped by our ancestors the Britons, before the church of St. Ives was erected or endowed.” An hexagonal shaft surmounting the west end of the roof has every appearance of having been intended to support a cross, or perhaps merely the vane referred to below. At what date this chapel was desecrated we have failed to ascertain, but that it was kept in repair as a chapel until recent times is shown by the following copies of some of the many references to the subject in the churchwarden’s accounts:—

“1738 To paid Carpenters and Masons in order for rebuilding the Chapel on the Island . . . £3 . 3 . 3 $\frac{3}{4}$ ”

“Nov. 4 To the workmen about the Chapple on the Island £4 . 16 . 0”

“To making the Vane and plaistering the Chapple £1 . 12 . 2.”
 “1746 To Emanuel Riggs for joiners work on Church and Island Chappel 17/4.”

From the borough accounts (one of the most interesting volumes I know) I extract :

“1592. Ite' paide to John Kalamey for mendinge St. Nicholas Chappell 1s. 4d.”, and under 1689 we find several entries suggestive of its having been damaged by storm, one of the items being “pd Try to save the helling-stones blowne of, 6d.”

St. Leonard's Chapel is still preserved, though now only serving as a shelter for men using the pier that it adjoins, and with nothing in its appearance to suggest its history. All lovers of history must feel grateful to Mr. Edward Hain who, in 1886, caused it to be repaired and so preserved one of our links with the past.²⁶ It is said that, during the middle ages, this chapel was especially devoted to the use of the fishermen who maintained a chaplain to say mass for them there, they paying him by an offering of fish proportioned to the amount caught by them. I do not know the authority for this statement. It was at any rate kept in repair. In the borough accounts, under date 1592, we find, “paid two men one day about St. Lenards chappell.” There are several references in these accounts to “the chapel,” but there is nothing as a rule to show which chapel is referred to. The following, however, clearly refers to St. Leonard's, 1696, “pd to amend the chapel on the Kay, 16s. 10d.” In the churchwarden's accounts of 1792 is “For work about the church, chaple, &c., £1 . 7 . 11.” If this refers to St. Leonard's it was probably the last work done on it, as, according to tradition, it has not been used as a chapel for at least a hundred years.

There was formerly a chapel on the rocks at Porthminster which, with the surrounding village, was burned down by French sailors in the time of Henry VI.²⁷ The foundations are said to have been traced as late as 1870, near the spot where they found two stone coffins, each containing a leaden chalice.

²⁶ Cornwall is much indebted to this gentleman, who has performed many useful acts such as this. It is to him we are indebted for the discovery and preservation of the early borough accounts, which he has, moreover, done so much, by lecturing and otherwise, to make accessible and interesting to others.

²⁷ Was it in consequence of injury done by the same visitors that the church was at this time re-built?

Lysons state that in 1814 the foundations of an oratory were visible at Higher Tregenna; and Dr. Borlase, MS. Collections, quoting the Exeter Episcopal Registers²⁸ mentions "the Chapel of Saint Ante, alias Ansa, prope ripam maris" under the year 1495, at Saint Ives, in which a guild was established, and says that it was turned into a smith's shop in June, 1770.

The Mariner's Licensed Chapel, opened 23 Aug., 1867, was situate in a side street near the quay. It was an upstairs room, apparently once a loft of some kind, and nothing in its external appearance suggested its use except a small cross on the roof. It was, however, well worthy of a visit, and afforded an example of what can be done by the expenditure of thought and exercise of taste to make a church at a very trifling expense. The room, of which the fittings and furniture can only have cost a very few pounds, was infinitely more ecclesiastical in appearance than many of our district churches, the erection of which has entailed considerable expenditure. When Opie was asked what he mixed his paints with, he replied, "with brains, Sir!" The same ingredient, with plenty of good taste as well, had been used here. This interesting building was pulled down in October, 1903, and a room at the back of the White Hart Hotel in Fish Street was opened under date of the bishop's licence, 8 Oct., 1903, at which time was begun the new Mariner's Church (in memory of the late Canon Jones.) This new building, of which the walls are now nearly completed, is in Norway Lane, and stands partly on the site of the demolished chapel. The architect is Mr. Edmund Sedding, and, as far as can be judged from the unfinished building, the new church will be a work of exceptional merit.²⁹

28. I have failed to trace this in the registers.

29. If any of my readers are not acquainted with the valuable notes on the architecture of Cornish churches that Mr. Sedding frequently contributes to the Truro Diocesan Magazine I strongly advise their becoming so.

NOTE. For the extracts from borough accounts, &c., I have mostly trusted to Mr. Matthews' History.

A CATALOGUE OF SAINTS CONNECTED WITH CORNWALL,
WITH AN EPITOME OF THEIR LIVES, AND LIST OF
CHURCHES AND CHAPELS DEDICATED TO THEM.

By the Rev. S. BARING-GOULD, M.A.

PART VII. *Od.—Pa.*

S. ODULPH, Canon, Confessor.

The church of Pillaton is dedicated to this saint. There is an Adulph or Odulph, reputed to have been bishop of Maestricht, who, it is pretended was a brother of S. Botulph. He is reported to have left England, gone to the Low Countries and become a bishop there. He is, however, an apocryphal personage, though he has found his way into the Roman Martyrology. All we know of him is from an addition made late to the early life of S. Botulph, full of anachronisms and absurdities. No bishop of the name of Adulph, or Odulph, ever sat at Maestricht.

His name occurs in the Roman Martyrology on June 17. There was, however, a real saint of this name who is found in the *auctuarium* to Usuardus on June 12. He was a canon of S. Salvator, at Utrecht, after having been parish priest of Orescoth. He died of fever, June 12, 865. The authority for the dedication of Pillaton to Odulph is an Inquisition held by Bishop Bothe in 1467 with regard to the patronage of S. Dominick.

Whytford gives him on June 12.

S. OLAVE (= GWYNLLYW), King, Confessor.

A church in the portion of Exeter formerly the British city, and another at Poughill in the heart of the Brecknock-Gwentian colony, bear the name of S. Olave.

That this should be the Norse king who fell in 1030 is possible enough at Exeter, it is most improbable at Poughill.

In 1067, the church of S. Olave in Exeter was given by William the Conqueror to Battle Abbey. It had previously been endowed with land by Gytha, the mother of Harold, for the benefit of the soul of her husband, Godwin, who died in 1053, but we do not know that it was then founded. As S. Olaf had been killed in fighting against Canute, who had driven him from his kingdom, and as Olaf was the favourite saint of the national Norse party which opposed Danish domination, it is scarcely likely that so early as 1053, Gytha should have had a church in Exeter re-dedicated to such a Saint. I think that perhaps in Exeter and probably at Poughill the Danish king has been mistakenly substituted for a British saint.

Newport on the Usk is situated much as Exeter was at the point of junction of the British and English peoples. At Newport is the church of S. Gwynllyw, in Latin Gundleus, which the English inhabitants of Newport converted into Olave. Leland says (*Itin. II*) "The chireh of S. Guntle—Olave in English."^{*}

Mr. Egerton Phillimore says, "With regard to the form S. Olave, Olave must be a deliberate alteration of some form assumed by S. Gwynllyw's name into an English (Northman) saint's name of somewhat similar sound. Such substitutions occur in Wales, and are especially common in Brittany, where they are the work of Gallicising priests." He gives an instance near Milford, when S. Budoc has within a few years been transformed into S. Botulph.

I take it then that possibly at Exeter and at Poughill we have churches of S. Gwynllyw, perhaps inadvertently, and then deliberately altered to dedications to S. Olaf. As both were kings, the change was easily effected.

The cult of S. Gwynllyw was carried into Brittany, where he is called S. Gonlay.

Gwynllyw was, however, never out of Gwent, so far as we know, and it is possible that the real saint who has become Olave in Exeter and at Poughill may be, not Gwynllyw himself, but his son Gwodloyw. Another son, Gluvias, we know did settle in Cornwall. It is worthy of note that the inscribed stone at

^{*} See also Johns (W.H.) History of the Church of S. Gwynllyw, Newport, 1891, p. 24.

Stowford to Gungleus gives us a later form of a name closely allied to that which prevailed in this Gwentian royal family. In Welsh it would be Gwynglyw. Owing to the doubt that must prevail as to who the Olave of Exeter and Poughill was, I do not give the life of S. Gwynullyw, although one of great interest.

His day is March 29; but in Brittany June 29, but has been transferred to July 3, as the former day is the eve of SS. Peter and Paul.

In art, S. Gwynullyw should be represented as a king with a white ox by his side, having a black spot between his horns.

The date of the death of Gwynullyw was about 550. He is one of the saints invoked in the 10th century Exeter Litany, where his name is spelled Gwenleue.

S. PADARN, Bishop, Confessor.

There were three saints of this name, which is the Welsh form of Paternus; but with only one of these are we concerned. It is, nevertheless, necessary to enter briefly into the history, as far as known, of the other two, because in the only Life that we possess of S. Padarn, all these have been rolled into one.

The three of the name of Paternus are these:

1. Paternus, first Bishop of Vannes, who was appointed to the See in a Council held at Vannes in 465 or within a year or two of that date. Of him absolutely nothing else is known.

2. Paternus, Bishop of Avranches, 552-570, whose Life was written by Venantius Fortunatus. He was born at Poitiers about 480, sent to the monastery of Encion, now Saint-Jouin, then embraced a solitary life at Sisci, now Saint-Pair near Granville, about 510, was chosen bishop of Avranches in or about 552, subscribed the decrees of the Council of Paris in 557 and died in 562. His mother's name was Julitta.

3. Paternus or Padarn, son of Pedrwn and Gwen, his wife. He was born in Armorica, migrated first to South Wales and then to Ireland. Returned to Wales and founded the monastery and see of Llanbadarn Fawr in Cardiganshire, and died about 550. A Life of this Padarn exists in the Collection of Lives of Welsh Saints in Vesp. A. xiv, a MS. of the 12th or

early 13th century, and this has been published by Rees, in his "Lives of the Cambro-British Saints." This Life is a composition of the same date as the MS., and in it Padarn of Llanbadarn is confounded with Paternus of Vannes.

In addition, there is a Life of Paternus of Vannes in the Leon Breviary, printed in 1516. This confounds him with his namesake of Avranches. We will now take the legend as we have it in complete form, and afterwards proceed to give a critical examination of the story.

Paternus was born in Armorica, and was of noble race. Shortly after his birth, his father Petran or Pedrwn abandoned his wife Gwen that he might go to Britain to embrace the religious life. But from Britain Pedrwn went on to Ireland there to complete his monastic training. Paternus remained with his mother till he attained to man's estate, and then he started in quest of his father, and he went along with a large company, the names of three of which are given, Hetinlan, Catman and Titechon. In the Breviary of S. Malo they are Tinlatu, Cathlian, and Techo, and the Legendarium of Treguier gives them as Cuilan, Cathinam, and Techocho. These three were his cousins. The party reached Britain and settled in Mauritana, where Paternus became the head of a monastery consisting of 847 monks. After having organised it, he departed for Ireland, where he found his father, but was quite unable to induce the old man to return to his wife and his domestic duties. In Ireland two kings were engaged at this time in warfare—quite an ordinary condition of affairs. S. Paternus succeeded in reconciling them. That accomplished, Paternus returned to his monastery in Britain, which he found in a flourishing condition, and augmented by the arrival of a monk named Nimanauc, who had crossed over on a floating rock.

Paternus now founded a number of churches in Ceretica, and confided them to his disciples Samson, Guinius, Guipper and Nimanauc. The peace of his community was speedily disturbed by Maelgwn Gwynedd, who made war on the south of Wales and arrived at the head of a large army at the mouth of the Clarach. To find an excuse for pillaging the territory of Paternus, Maelgwn left with him on his passage a

number of hampers which he said contained treasure. On his return, he demanded them back, when they were found to be filled with earth and stones only. Paternus vowed that he had not meddled with the contents, and demanded of the king that he and two men, stewards of the king, who had placed the hampers in his custody, should undergo the ordeal of plunging their hands in boiling water. The stewards scalded their arms, but that of Paternus was unhurt. Maelgwn was struck with blindness, and only recovered his sight at the intercession of the saint. He then made a large grant of land to Paternus between the rivers Rheidol and Clarach.

Soon after, an angel bade S. David take with him Paternus and Teilo and go to Jerusalem. The three accordingly visited the Holy City where the Archbishop consecrated them bishops, and they divided S.W. Britain between them into three sees. The kingdom of Seisil was to form the diocese of Paternus, that of Rein was to be that of David, and the kingdom of Morgan was to be under the crosier of Teilo. Paternus received from the patriarch of Jerusalem a present of a tunic woven in one piece and of gold tissue, as well as a pastoral staff.

On his return to Britain, this tunic was the occasion of a dispute with King Arthur, who asked to have it, but was refused. Arthur stormed and made threats of vengeance, when the earth opened and swallowed him up to the chin. Only on his asking pardon was he released from this unpleasant situation.

Caradoc Freichfras now invited Paternus to come with him to Llydaw, because the Armoricians had threatened revolt against Caradoc, under whose sceptre they were, unless Paternus were restored to them. Paternus assented, after having been twenty-four years in Britain; and accompanied Caradoc to Brittany, where he was placed on the episcopal throne "in the city of Guenet," *i.e.* of Vannes.

Envious persons, however, strove to make dissension between him and S. Samson, who at the time was Archbishop of Dol, and they told Samson that Paternus refused to acknowledge his jurisdiction, and to pay the accustomed tribute to the metropolitan see. Samson accordingly went to visit him, and when he was near Vannes, sent word that he was approaching. The message

reached Paternus as he was dressing, and he ran forth with alacrity to meet the archbishop, half dressed as he was, with one shoe and stocking on and the other foot and leg bare. Samson was so gratified that he exempted for ever the church of Vannes from the customary dues to the archiepiscopal stool.

The seven bishops of Llydaw met in council on a mountain to establish their unity in the faith and in discipline; and in this council Paternus was present.

In his old age Paternus left Armorica for the country of the Franks, where he died on the xviii Kal. May (April 15). Three years ensuing after his death, all Llydaw was afflicted with famine, and delegates were sent into the country of the Franks to bring back the body of the bishop to Vannes.

Such is the legend, which, though full of anachronisms and errors, contains a substratum of truth. It has been examined by M. de la Borderie: "Saint Patern, sa legende et son histoire, Vannes, Lafolye, 1892." But he has fallen into mistakes, and had not at his disposal the clue to one of the principal difficulties in the story. M. de la Borderie rightly judges that the legend, as we have it, points to its having been composed in Brittany, and almost certainly at Vannes. But, as will be seen presently, there is evidence that this hagiographer had a Welsh original as his basis, on which he embroidered.

We will now take the story in order, and eliminate from it the elements that do not belong to the original "Life," and explain the confusions into which the redactor fell.

Padarn was the son of Petran and Gwen, and was born in Armorica. From the Welsh Genealogies we know more about him, Petran, or Pedrwn as they call him, was brother of Amwn Ddu, the father of S. Samson, and of Umbrafel, father of S. Maglorius, and of Dervella who married Caradoc son of Ynyr Gwent, by whom she became mother of S. Malo. Another brother was Gwyndaf Hên, father of Meugant. Pedrwn and the rest were the children of Emyr Llydaw, driven out of the district of Broweroc, or the land about Vannes, colonised by British settlers. Probably some family revolution occasioned this flight of the sons of Emyr from Armorica. De la Borderie airily says:—"Cette prétendue emigration est une pure fable, inspirée

par les besoins de la cause, c'est-a-dire par la nécessité d'expliquer la prétendue émigration du Patern armoricain en Grand-Bretagne." The Welsh authorities are not, however, to be so lightly set aside. There was no occasion for them to fable such an emigration, and nothing was more common than the flight of brothers after the death of their father, to escape massacre by their most masterful brother. Guerch or Weroe who gave his name to Broweroe may have been this brother who drove them from their inheritance, or may have been the son of a brother of Emyr Llydaw who expelled him.

As Padarn was born before the flight of the family, he must have been considerably older than Samson, who was born some time after Amwn had settled in Wales, and had taken to him as wife a daughter of Meurig prince of Morganwg.

On reaching man's estate Padarn with a large body of followers migrated to Wales. From Welsh authorities we know that he did not head this body, but formed one member of it, which was under the direction of Cadfan. Hetinlau, Tinlatu, or Cuilan,* as the name of his first comrade is invariably rendered, may possibly be the Lleuddad of the Welsh list. Catman or Cathinam cannot be recognised. Techo, Techocho, or Titechon, or as Albert Legrand give it Tedecho, is Tydecho son of Amwn Ddu. In Britain, Padarn founded a monastery in Mauritana, that is at Llanbadarn fawr, in Ceredigion or Cardiganshire. There he had as his disciples Samson, his first cousin, Guinnius, Guipper, and Nimanaue. Guinnius is the only one of these who has left his name in the district, at Llanwynio, and that is in Carmarthenshire. But it is possible that Nimanaue may be Ninio the Old, who is the same as Meungan.

Maelgwn Gwynedd with whom he had trouble ruled from 540 till 547 when he died of the Yellow Plague. Arthur, who in the legend plays a contemptible part, fell in 537, according to the *Annales Cambrie*. The story of the quarrels and miracles is introduced to account for the extent of land over which Padarn exercised jurisdiction. This included a part at least of Radnorshire as well as Cardiganshire.

* Albert le Grand gives *Cuivilan*.

The story of the pilgrimage to Jerusalem, and the ordination by the patriarch, was a deliberate fabrication of the Welsh ecclesiastics in the 12th century, when they were struggling to maintain their independence, and that of their church from subjection to Canterbury. This can hardly have been invented before 1100; but it was already in the life of Padarn, when it came into the hands of the Vannes amplifier. Next we come to the expedition of Caradoc Freichfras to Brittany, and his placing Padarn as bishop "in the city of Gwenet." Such an expedition is totally unsubstantiated by early Breton historians. The story apparently arose thus:

Caradoc Freichfras was lord of Gallewig, a principality in Cornwall between the Llynher and Tamar, of which the town of Callington and the manor of Kelliland are the modern representatives, but which probably included the Bodmin Moors. Caradoc has left his name there on Caradon. In this region are to be found the Petherwins, *i.e.*, the Gwent of Padarn. The word signifies "Open downs" and it was applied to those upland districts which were treeless, and stood bare for the feeding of sheep, above the vast all-embracing forests. It was latinised *Venta* and was applied to *Venta* (Winchester) to *Venta Icenorum* (Norwich) and *Venta Silnrum* (Caerwent).^{*} The two extensive parishes of the Petherwins, together with their daughter churches of Trewen and Werrington stretch over 18,400 acres. Much of the district is high, bleak land, a veritable Gwent. Now Caradoc, as prince of Gallewig, very probably did invite Padarn there, and made over to him the lands of this Cornish Gwent. This was latinised into *Venedotia*, and when the Breton ecclesiastic read the legend of the Welsh Saint, he at once supposed that this must have been the *Venedotia*, Vannes, with which he was acquainted. This was further helped by his misunderstanding Cornwall for Cornouaille. Albert Le Grand endeavoured to solve the difficulty of the presence of Caradoc in Brittany by supposing him to have been identical with Gweroc or Weroc, count of the British settlers in Vannes; but this is inadmissible, and the real solution is that proposed, *i.e.*, the confounding by the Vannes redactor of the *Venedotia* in Cornwall, with the Armorican *Venedotia*.

^{*} Green (J. R.) *The making of England*, 1897, I. p. 10.

The next point in the story is that of the interview between Padarn and Samson. This was probably in the original Welsh legend, but the redactor gave it a colouring of his own to serve a special purpose.

S. Samson, when on his way from South Wales to Armorica, crossed to Cornwall and landed at Padstow, where he was met by Gwethenoc, who was sent to meet him, as we ascertain from his *Life*. This Gwethenoc is the Winius of the *Life of Padarn*. The *W* in early Breton became *Gw* after the 10th century, and the *th* became *z* or was wholly dropped. Gwethenoc was founder of Lewanick and patron of St. Enodoc. That Samson visited the Gwent of Padarn is probable enough. He would take it on his way from Padstow to Southill where he made an important foundation. And that the incident of Padarn running to welcome his cousin half shod was in the original *Life*, is probable enough, and is just one of these little touches of nature likely to be true, and very unlike the laboured inventions of professional hagiographers. But when this story came into the hands of the Breton redactor he saw his opportunity for making polemical use of it.

It was not till 848 that Nominoe erected Dol into a metropolitan see, and constituted six dioceses in Brittany subject to it, *i.e.*, S. Malo, S. Brienc, Tréguier, S. Pol de Leon, Quimper and Vannes. It is more than doubtful whether some of these had been previously episcopal sees, and other than great abbeys. Vannes and Quimper writhed under this new arrangement, and sought release and subjugation to the more distant Tours which claimed jurisdiction over them, enforced by papal order, and decrees of Frank councils. To obtain an excuse for release, a Quimper hagiographer fabricated a *Life of S. Corentin*, which, regardless of chronology, made that saint seek ordination from S. Martin of Tours, and so this redactor of the *Life of S. Padarn* used his opportunity of adapting the story of the saint who bore the same name as the first bishop of Vannes, to suit his purpose, and made S. Samson release the see of Vannes from its obligations to the archepiscopal stool of Dol.

He further worked into the story the incident of the gathering of seven saints on Menez Bré to curse Conmore the usurper of Dommonia, which took place between 550 and 555,

and converted it into a Council of Bishops. At that convocation two of the seven present were not bishops at all, Gildas was a priest and abbot, and Huarve was a bard and exorcist.*

The biographer goes on to relate that Paternus abandoned his see of Vannes and departed to the country of the Franks, where he died. "Letaviam (Llydaw) deserens Francos adivit, ibique in Domino obdormivit."

This was an insertion by the Breton redactor, who knew of a Paternus of Avranches, and that this Paternus died and was buried at Avranches. He knew that the body of Paternus, first bishop of Vannes, reposed at Vannes, and he supposed that the body of the second Paternus, son of Petran and Gwen, must be that lying at Avranches, and then he invents a story of a translation of the relics of this second Paternus to Vannes. Le Mené in his "Histoire du diocèse de Vannes," says "en résumé, pour nous saint Patern I est fabuleux," *i.e.*, a supposed Paternus of the period of Conan Meriadoc; "Saint Patern II (mais qui en réalité est bien Saint Patern I puisque l'autre n'a pas existé) est le premier évêque de Vannes"; *i.e.*, Paternus appointed by the Council of Vannes, *circa* 465; "Saint Patern III est étranger au diocèse," *i.e.*, Padarn of Llanbadarn fawr.

We come, finally, to the Welsh accounts of S. Padarn, apart from the "Life." Padarn accompanied S. Cadfan to Wales, along with his uncle Tydecho, and their migration is supposed to have taken place at the beginning of the 6th century.† We can hardly put it later than 520. On his arrival, according to Achau y Saint, he became a disciple of S. Illtyd, no doubt in Inis Pyr or Caldey. After that he established a community of a hundred and twenty members in Cardiganshire at Llanbadarn fawr. From the Latin hexameters of John ap Sulgen, who wrote at the close of the 11th century, we learn that it was traditionally believed that he remained at the head of Llanbadarn fawr for twenty-one years, and this is confirmed by the Latin

* De la Borderie, Saint Hervé, Rennes, 1892, p. 269. The *Vita* was composed or re-composed in the 13th century. In it seven saints are not specified. The gathering was, "Conventus præsulorum et populorum, ut excommunicarent prefectum regis Conomerum." The Life of S. Padarn is the authority for making the number seven.

† Rees: Essay on the Welsh Saints, p. 213.

Life. In his extreme old age he retired to the isle of Enli or Bardsey, where he died and was buried.

It is worth noting that it is supposed that he lived for a while in a cell on an islet in the vast morass about Glastonbury. Padenbeorg, now Pamboro, is thought to recall Padarn.*

We come to the chronology of his life. There is not much on which to build. During the one and twenty years he was at Llanbadarn, he was harassed by King Arthur who died 537, and by Maelgwn who died 547. He was only a youth arrived at man's estate when he came to Wales with S. Cadfan, and then he placed himself under Illtyd and visited his father in Ireland. If we suppose that he left Llanbadarn about 548, then he went there in 527; and allowing ten years for his training and his visit to Ireland, he crossed over from Armorica in 517; and was born about 490. But he was certainly older than his cousin Samson, who is supposed to have died in 563. If Samson died aged 80, he would have been born in 483, and he certainly was not older than Padarn. It is more probable that the birth of Padarn was 480 or even earlier. We have no data for fixing his death, but it probably took place a few years before that of S. Samson.

A 12th century Welsh calendar gives as the day of S. Padarn, April 15th and September 23rd. A pre-Norman calendar, added to later at Evesham, gives only September 23rd. Whytford gives April 15, and makes no reference to the fable of his having been Bishop of Vannes.

The Gloucester calendars of 13th century (Bodl. MSS. Rawlinson Litt. f. 1), and another in Jesus College, Oxford (MS. ex.), and one of the 15th century (B.M. Add. MSS. 30,506) give April 15th.

In Brittany the following give April 16th,—Missal of Tréguier of XV century, Missal of Vannes 1530, Breviary of Vannes 1589, Proper of Vannes 1660, and 1757 and subsequent Propria, also the Breviary of Quimper of 1660, 1701 and 1835, and the Breviary of Leon 1736.

* Canon Church: "The Western Antiquary," Vol. V. (1886) p. 79.

May 21st, the Ordination of S. Paternus is entered in the Vannes Missal of 1530 and in the Breviary of 1586, but in that of 1660, it is altered to "Translatio Sti. Paterni."

Sept. 23 is given in the S. Malo Missal of 1609, and the Breviary of 1537 and that of Dol 1519. Sept. 24 is the day in a MS. Missal of S. Malo of the XV century.

Albert Le Grand and Lobineau give April 16th. The calendar of the 13th century Breviary of S. Yves, gives the same day. It is certainly curious that, whereas the "Life" says that Padarn died on the xvii kal. May (April 15th) the Breton calendars should give as the day, April 16th. The three festivals in commemoration of him observed in Brittany were, his day of general commemoration, that of his ordination, and that of his assembly with the other bishops on Menez Bré.

The churches bearing the name of Padarn in Wales are:—Llanbadarn Fawr, which was an episcopal seat till 720 when it was destroyed by the Saxons,* after which the see was incorporated in that of S. David's.

Llanbadarn Fach on the right bank of the Arth, half-way between Cardigan and Aberystwyth. Llanbadarn Odin on the left bank of the river Aeron. These are all in Cardiganshire. In Radnorshire are Llanbadarn Fynydd, Llanbadarn Fawr, and Llanbadarn y Carreg.

Foundations of the saint in Devon and Cornwall are North and South Petherwin. Werrington was another according to the Bull of Celestine III to the Abbey of Tavistock, which speaks of Werrington (Walrington) as a church of S. Paternus. On the reconstruction of the church it was rededicated to SS. Martin and Giles, as Paternus was not then in the Roman Martyrology. In Brittany S. Paternus of Vannes has no special symbol; but Padarn might well be represented with one leg clothed and the other bare.

The principal authority for the life of S. Padarn has already been given. A *vita* of the XII or early XIII century published by Rees in his "Lives of the Cambro-British Saints," Llandovery, 1853, pp. 188-197. John of Tynemouth who wrote in the 14th century (*circa*. 1360) inserted an abridgement of this life in his

* Brut y Tywysogion *sub. ann.* 720.

Sanctilogium Britanniae, which afterwards passed into Capgrave's *Nova legenda Angliæ*, printed in 1516. But Capgrave died in 1464. Fragments, more or less extended, of the 12th century life, divided into lections, exist in the Breviary of Treguier in the Bibliothèque Nationale at Paris (MS. lat. 1148), and in the Breviary of S. Malo of 1537. The Life in the Breviary of Léon, 1516, as already pointed out, confounds Paternus of Vannes with Paternus of Avranches.

A MS. Life of S. Padarn of the 13th century is in the Bibliothèque Nationale, Paris, 5666, p. 13.

The Life in the *Acta SS.* 5th April, II. p. 378 is after Capgrave.

THE STANNARIES OF CORNWALL.

This paper was read by the late H. W. Fisher, V.W. of the Stannaries, on behalf of the Royal Inst. of Cornwall, at the third annual joint meeting of the Cornish Scientific Societies. The Council consider it worth printing, although, unfortunately, it cannot have revision by the author.

I propose to give a short account of the Convocations, or Parliaments of the Tinnars of Cornwall of which we have records, valueless, I know, to those who are already familiar with the subject, and to others, I fear, likely to prove very uninteresting. However without further apology I preface it with a chronological list of them.

I. 30 Elizabeth¹ (A.D. 1589). Held at Lostwithiel under the queen's signet and a warrant from Sir Walter Raleigh, lord warden, to the mayors of the four stannary towns, Truro, Lostwithiel, Launceston and Helston.² Sir Edward Smirke in his appendix to *Vice v. Thomas* gives (page 48) a transcript from an old copy of the presentments of this convocation which he says appears on comparison with others (all apparently in private hands) to be one of the most complete, though evidently imperfect.

II. 22 James I (A.D. 1625) recited at length in 26 George II. It is not mentioned whether the Crown or the duke of Cornwall issued the commission to the lord warden. Presumably it would have been the latter. This convocation was held at Lostwithiel before William Coryton, esqr., vice-warden, by direction of William, earl of Pembroke, lord warden.

III. 12 Charles I (A.D. 1637). Held at Lostwithiel from 15 August and continued with prorogations till 3 September, before William Coryton, esq., vice warden, by direction of

1. The presentments of 16 Henry VIII referred to in 22 James I., art. 33, were not the presentments of a Convocation but of Commissioners appointed to enquire into and settle certain doubtful customs of the Stannaries in Cornwall. See Sir George Harrison's "Report on the Laws and Jurisdiction of the Stannaries in Cornwall," p. 34. A similar commission had been appointed 5 Edward III to enquire into usage and customs, Sir Ed. Smirke's *Vice v. Thomas*, p. 20.

2. This is the warrant requiring them pursuant to the Charter of Henry VII to summon 24 Stannators, six from each Stannary, to the Convocation.

Philip, earl of Pembroke, lord warden, by virtue of the King's Royal Letters under the signet to him directed.

IV. 2 James II (A.D. 1687). Held at Lostwithiel under the king's commission before John, earl of Bath, lord warden, on 26 October, and continued by adjournments³ to 11 October, 1688.

V. 2 Anne (A.D. 1704) held at Truro by virtue of the queen's commission under the privy seal before John, Lord Granville, lord warden.

VI. 8 Anne (A.D. 1710). Held at Truro under the queen's commission before the honourable Hugh Boscawen, lord warden, on 20 February, and continued by adjournments to 20 April in the following year.

VII. 23 George II (A.D. 1750). Held at Truro and by adjournment at Helston, before Thomas Pitt, esq., lord warden, by virtue of the commission⁴ of Frederick Lewis, Prince of Wales, under his privy seal.

VIII. 26 George II (A.D. 1752). Held at Truro before John Hearle, esq., vice warden, by direction of James, earl of Waldegrave by the king's commission under the privy seal on 25 August, 1752, and continued by adjournments to 11 September in the following year.

The "laws, customs and constitutions" of 22 James I, 12 Charles I, and 2 James II, are recited at length in the enactment of this last parliament, and they are severally declared to be farther ratified, established and confirmed so far as they are unexpired and not repugnant to any Act of Parliament, or to any Act, or constitution made in subsequent convocations.

The published volume of the Laws of the Stannaries of Cornwall (1824) gives what purports to be the enactments of

3. One of the adjourned meetings was held at Launceston. The last adjournment was to Saltash (Pearce, "The Laws and Customs of the Stannaries in the counties of Cornwall and Devon," p. 108), but there is no record of a meeting there. People had other things to think of just then. The proceedings of this Convocation are most fully set out by Pearce. It seems highly probable that the author is the Mr. Thomas Pearce referred to in connexion with them at page 105. This gentleman received a gratuity of £30 for his services at the Convocation (p. 96).

4. The royal warrant for issuing the commission is set out in Serjeant Mannings' Appendix to Rowe *v.* Brenton, 3 Manning and Ryland, p. 497.

2 Anne, but they do not correspond with those which are set out in Pearce.⁵

The convocation of 8 Anne⁶ like the preceding one had for its sole object the settling of the terms of pre-emption, and there is naturally no reference to it in the presentments of 26 George II.⁷

Nothing was done by the Convocation 23 George II, to which I will allude later.

We see now under what authority these convocations were held, where they were held and under what presidency. Their composition was fixed by what is generally known as the Charter of Pardon, 23 Henry VII (A.D. 1508), which prescribed (in substance) that no statutes, acts, ordinances, &c., &c., be made unless there be first called twenty-four good and lawful men from the four Stannaries in the County of Cornwall, i.e., six men from every Stannary to be elected thus: by the Mayor and Council of Truro six 'good and lawful men' of the Stannary of Tywernhaile, by the Mayor and Council of Lostwithiel the like of the Stannary of Blackmore, by the Mayor and Council of Launceston the like of the Stannary of Fowymour, by the Mayor and Council of Helston, the like of the

5. Sir E. Smirke in a MS. note in my possession asks if there is any MS. original of this Convocation, which is not recited in the roll 26 George II in the Duchy office. He adds that there is a detailed statement of the proceedings in the Gregor MS. p. 365. The object of the Convocation was to settle the terms of pre-emption for seven years. Pearce gives a full account of the proceedings but I do not know from what source derived.

6. The proceedings were lively and are fully described in the appendix to Lord de Dunstanville's edition of Carew. The Stannators were divided into two parties, those who were in favour of a farm (which of course meant a fixed price) and those who were against it. The former were styled "the court party," the latter "the country party," but "the mob" were vehemently in favour of the farm and it was ultimately carried *nem. con.* on the terms proposed.

7. For the benefit of those to whom the whole of this subject may be new I will say shortly that this right of the pre-emption of tin by the Crown or the Duke of Cornwall (as the case might be) supposed to be founded on the reservation of the Charter 33 Edw. I. is of earlier origin. See Sir E. Smirke's *Vice v. Thomas*, p. 91. The fixed price to be given by the king's farmers of the pre-emption was a subject of negotiation and discussion (at all events after the Charter of Henry VII) at the Tinnars' Parliaments. Whatever instances to the contrary occur in earlier times the latter exercise of this right seems to have been popular with the Tinnars who were more afraid of "the combination of merchants" than of the Crown. There is ample evidence of this. See Pearce, p. 99 and *infra*.

Stannary of Penwith-Kerrier.⁸ This continued to be the constitution of these Parliaments as long as they lasted. But a difficulty arose from the assumed necessity of unanimity on the part of the twenty-four Stannators in order to give validity to a constitution under the terms of the Charter, and the 1st article of 12 Charles I runs as follows:—"For that the unanimous consent of the full four and twenty (according to the letter of the Charter of Pardon) may not be had to every ordinance propounded, to the end that our endeavours for want of one or a few voices shall not fall to the ground, we following former precedents and usage do agree, constitute, and ordain, that whatsoever propositions shall be affirmed and concluded by sixteen voices or more, but not under, the same shall stand and be binding as the act of us all."⁹

This article is interesting as pointing directly to precedents now lost of earlier date than the reign of Henry VII.¹⁰ We have no evidence to show how these parliaments were composed, how often they met, or what were their powers. The Charter of Henry VII clearly put them on a new footing and greatly enlarged their powers. "Henry VII by his new Charter restored to the Tinnars all their former privileges (said to have been forfeited) and enlarged them with this honourable and important addition that no laws relating to the tinnars should be enacted without the consent of 24 Gentlemen Tinnars,"¹¹

8. The Charters of John and of Edward I do not mention the convocations, though of course they may have been included amongst the "*liberas consuetudines*" confirmed in the latter.

9. From Sir George Harrison's Report (1835), we learn that a question had been raised whether this enactment was not *ultra vires* of the Stannators and whether the last Stannary enactments of 26 George II were not invalid as being signed by 23 Stannators only. The same might be said of at least one previous convocation, 2 Jas. 2, whose enactments were signed by the Lord Warden and 19 Stannators. The point is of no interest, but it is discussed by Sir G. Harrison. Sir E. Smirke says "It is not clear that the Charter requires unanimity, and it should seem that a majority would be sufficient unless there is a special usage anterior to the Charter inconsistent with it."—MS.

10. See also preamble to 2 James II. The Stannary Records at Lostwithiel, were, as is well known, destroyed during the Great Rebellion.

11. These 24 Stannators continued to be chosen from the principal families in the county. They must be distinguished from the like number of "the most discreet Tinnars" who from very early times were summoned to attend the Stannary *Law Courts curie legales or lela or megna* held twice in the year by the Steward of each Stannary, differing from the ordinary Curie Stannarie held every three weeks to make presentments of offences and also of Stannary customs, acting as a Grand Jury. They had no enacting power. 30 Elizabeth, art. 26. 2 James II, art. 20. Sir E. Smirke's *Vice v. Thomas*, pp. 96-98, 58, et seq. Sir G. Harrison's Report, p. 91, citing also the exemplification of the Stannary customs by 16 Henry VIII, art 9.

six to be chosen by a Mayor and Council in each of the Stannary divisions.”—Borlase, p. 192, Camden’s *Britannia*, p. 4. It would be equally vain to attempt to fix any precise origin to the Parliaments. The gem of them, as thinks Mr. W. C. Borlase in his interesting *Historical Sketch of the Tin Trade in Cornwall*, may be found in the twelve *viri liberi et legales* summoned by William de Wrotham (9 Rich. I., A.D. 1198) to report on oath as to the weights in use for tin and to advise as to the disposition of the produce of the Stannaries. They may possibly have a still more primitive germ.

Time and space forbid me to describe the ceremonious proceedings of Convocation when assembled. Any one curious in the matter has only to consult the pages of Pearce. I will just mention that beside the 24 Stannators there was a kind of lower house of Convocation, or standing Council, called “Assistants,” each Stannator naming one. They were taken from “the most knowing and substantial tanners.” They met in a separate room and were called in to the Stannators whenever information or advice was wanted (Borlase, *Cornish Antiquities*, p. 193). For the more orderly dispatch of business the Stannators chose their Speaker and presented him to the Lord Warden to be approved, and “whatever,” says Dr. Borlase, “is enacted by this body of Tanners must be signed¹² by the Stannators, the Lord Warden (or his deputy, the Vice-Warden, who presides in his absence), and afterwards by the Duke of Cornwall or the Sovereign, and when thus passed has all the authority with regard to tin affairs of an Act of the whole legislature.”

The duties of Convocation were sometimes onerous. That of 2 James II held no less than 25 meetings at intervals between 26 Oct., 1686, and 26 Sept., 1688. Great pains were taken by this Convocation in settling the laws “regulating the old laws of the Stannaries and making new ones;” and the terms of the pre-emption gave much trouble. No company promoter of the present day could have worked harder than the earl of Bath seems to have done in order to “float” the farm in London.¹³

12. Signature is not required by the Charter of Henry VII.

13. Pearce, p. 89, et seq. The farmers were under covenant to make periodical advances for the benefit of the adventurers, and to give the fixed price for the number of years determined upon.—Smirke, *Vice v. Thomas*, p. 91.

He was obliged, at last, much against his will, "thinking no pains too great for the benefit and service of our country" to become a party with "a Society of Merchants" in the farm upon the terms of pre-emption agreed to by the Convocation, *i.e.*, £3 10s. per cent. Stannary weight.

Neither the Stannators nor the Assistants received remuneration for their services. The necessary charges of the Convocations (payment of clerks, etc.) were ordered to be paid by the Receiver-General of the Duchy.¹⁴

When we come to the work done by the Convocations we find that they by no means confined themselves to the presentments or declarations of ancient customs, but employed themselves also in the amendment of old laws and the making of new laws often of a very stringent character. The Stannators were summoned to the Convocation, 22 James I "to consult, enquire, and take into their consideration misdemeanors, and the several errors in the several courts, as also the several defects and abuses of Tin and Tinnors in general, and likewise for the replenishing of all ancient customs and privileges, with their continuance of time, as their ancient Charters have confirmed unto them, and upon mature deliberation to resolve upon such Orders as in their Judgments shall be thought expedient for the redressing and amending of any inconveniences or abuses within the Stannaries and to reduce things in question and doubtful (touching liberties and customs) to a certainty.¹⁵

It would be impossible for me within the limits of this paper to attempt any minute examination of the constitutions. I will only observe that the matters dealt with comprise those which appertain to the coinage¹⁶ duty, to the jurisdiction and

14. Pearce, pp. 96, 119, 128.

15. Pearce, p. 21. Many of the articles though in form new enactments are really declaratory of custom. Most of the Acts are declaratory, and "the Courts have sometimes refused to admit them except when they professed to be declarations of custom as in *Rogers v. Brenton*." Sir E. Smirke, MS. In *Vice v. Thomas* during the argument Lord Brougham interposed "The presentments of the Stannary Parliaments are, I apprehend, merely declarations of the custom." But Lord Lyndhurst, C., added, "Unless they are shown to have a prescriptive power of making bye-laws."

16. The coinage (*i.e.* stamping) of tin took place after weighing twice in the year. Before this was done no tin could be carried out of the county or used. The coinage duties at the rate of 40s. for every thousand weight of tin weighed and coined formed part of the revenues of the Duchy. They were commuted by Act of Parliament in 1838 and charged on the Consolidated Fund. The coinage towns were Liskeard, Lostwithiel, Truro, Helston and Penzance.

procedure of the Stannary Courts and to the rights and duties of the Tinnars *inter se* whether as Tin Bounders or (as we should say) as partners in a Cost Book Mine. It is noticeable that the term "Cost Book Mine" never appears in any constitution, but the principles upon which these mines were conducted and the appropriate legal procedure are clearly indicated.

Take for instance 2 James II, art 5. It would appear from this that although it rested with "the major part or greater number of the adventurers" to decide whether it was necessary "to buy or bring in rags, chains or materials," each of the said adventurers might buy or bring in his own part and proportion of the goods required and should not be forced to buy the same of any particular merchant or trader, but the amount of goods and materials necessary to be provided and the price to be paid for them is to be agreed upon by the major part or number of the adventurers at the time of passing their accounts, notice of which is to be given at least one week before the passing thereof to each adventurer or his agent or servant who is entrusted to manage the concern and tin work for him. If the adventurer does not manage his own work he is to leave the name of his agent with the purser or captain or principal adventurer. And if any adventurer sells or disposes of his right of adventure he is to give notice of the name and habitation of the person to whom the sale or disposition is made and should the adventurer die his executor or administrator is to give like notice of the name and habitation of the person who shall manage for him.

We have here all the outlines of the Cost Book system as we are familiar with it, but we are taken back to more picturesque and simple ways. Instead of the company as we know it with its managing committee, perhaps located in London, its shareholders all over the country, and perhaps a heavy debt at the bank, we see on a mine a community of tinnars, probably inhabitants of the district, each member of which has his own appreciable interest or "right of adventure" and is under the liability to contribute in specie what is required by the majority of his co-adventurers. Are we to infer from the article in question that this was the only mode of contribution practised at this time, or that it simply applied to that particular mode, which

however must have been common—and what was the remedy if any adventurer failed to contribute his portion of material? I should think it probable that the practice which was formulated so distinctly in 26 Geo. II, art. 11, and which in all its essential features was incorporated into stat. 6 and 7 Wm. IV, c. 106, and is the present procedure of the court in purser's suits, was put in force. In 1752 the practice of contributing in specie had probably become obsolete, no allusion is made to it whilst procedure is laid down to meet the case of the adventurer who refused to contribute his due proportion of the amount of costs incurred upon making up the three monthly account. Upon refusal to pay, his tin stuff was to be sold. If that proved insufficient his share, or so much of it as might be necessary, was to be sold by auction, the balance after payment of debt and costs to be paid over to the adventurer, but if the share was of no value it was to be divided amongst the rest of the adventurers in proportion to their shares.

The old practice which we have just noticed of adventurers severally bringing in their own proportion of material (and it would seem of labour also) accounts naturally for the provisions of the next article, art. 6) which lays it down that a party to whom any money shall be due for goods or wages shall only sue the person who contracted for the goods and the labour. We know that in time it became usual for the purser to represent the adventurers in the contracts made for the mine, and hence arose the established practice of making the purser the defendant in creditor's suits. This illustrates in a pointed manner the gradual substitution of a consolidated company with its agent for the looser association of older times.

Having fixed each adventurer with liability on his own contracts this article 6 proceeds with great particularity to enact that if he should be compelled to pay more than his proportion he shall have contribution against the rest, and that if any person shall be in arrear of their costs after the account is taken their tin and tin stuff shall be sequestered and remain as security until the matter is tried. The last paragraph indicates again the origin of the purser's suits to which reference has already been made.

One cannot read through these constitutions and not be struck by the good sense and the equitable spirit which pervades them. The lien on the adventurer's ore and right of adventure and the purser's suit which enforced it afforded a simple remedy which the law of England until comparatively recent legislation denied to adventurers suing each other, whilst the lien¹⁷ of the merchant and the labourers for goods or labour supplied, enforced by the creditor's petition, was equally simple and efficacious and further relieved the plaintiff from the annoyance of dilatory pleas to which he might have been exposed if suing at Common Law.

Happening to be at Oxford, at the suggestion of Mr. Enys, I took the opportunity of visiting the Bodleian Library in the hope that I might find something new and possibly of importance to report. As the very small result I will close this dry paper by a short account of two anonymous pamphlets which I found there, which are not important but are at all events comparatively amusing. The first is entitled "Aggravii Venetiani or the Venetian and other grievances, Together with a proposal for raising the price of Tin in the Counties of Cornwall and Devon, according to the policy of the Venetians when they had regained the Western Trade which they had almost lost.—London, 1697." The writer had been a resident in Venice and Zante. The chief wealth of the latter is its currants. He quotes Sir George Wheeler, who in his Travels says "The most serene Republick of Venice (as it is stiled) is the most ancient Free State that now flourishes in the world, and notwithstanding the great losses they have sustained from the innumerable armies of the Turks, have yet such large and fruitful territories as make them the object of envy and jealousy not only of the grand Signior but also of most Christian Princes. Zant is but a little Island, but to make amends it is one of the most fruitful and pleasant places I ever saw. Boterus called it the Golden Island, which it well deserves because of its fruitfulness and pleasantness of its soil, &c. But it now truly merits the name from the Venetians who draw so much gold from the Curran (*sic*) Trade as bears the ordinary

17. It is however singular that whilst the lien of adventurers upon the interest of a defaulting co-adventurer is clearly affirmed in the Constitutions there is no allusion to this well established lien of the mining creditor upon the effects on the mine. One may suppose that it was assumed, or was considered irrelevant.

charge of their Armada at sea. The Zantiots have not long known what to do with their currans and have been persuaded that we use them to dye cloth withal, being strangers to our Luxury of Pies, Pottage, Puddings, Cakes, &c. To maintain this Trade the English have a little factory at Zant consisting of a Consul and some merchants."

The first part of the pamphlet deals with the iniquities of the Venetians and our consuls and factors at Zante, but a "stout merchant" there, of course a Cornishman, Mr. William Pendarves comes in for no doubt well deserved praise. The upshot of the pamphlet is that the then languishing tin trade of Cornwall should be revived by the adoption of the policy of Venice, which "having almost lost the Western Trade imposed a duty (called the *Novissima Imposta*) of five dollars a thousand payable on all currans that should be laden at Zant, Cephalonia, or Theacca, on any Western ship that had not first discharged her full lading at the said City of Venice, and such ships only as come from Venice are called Free Ships and are free from paying that custom." He proceeds later on "And we having so far lost our Western trade of Tin that the labouring Timers can scarce get their bread, I am of opinion that we can regain it in some degree (if after the precedent) and example of the Venetians a *novissima imposta* be laid upon all such as shall buy and sell tin in the counties of Cornwall and Devon under three or four pounds a hundred or such a price as The King's most excellent Majesty, the Right Honourable The Lords Spiritual and Temporal, and The Honourable The Commons in Parliament shall think meet. And Tin being now at 50s. per cent. such an Imposition will be of considerable advantage to the nation both in general and particular."

He proceeds to argue that all classes of the community would gain by such a transaction and that there is no fear that the advancing the price of tin will cause the less quantity to be transported, because "there is no part of the known world besides Cornwall and Devon that doth produce Tin unless it be Germany and the East Indies, and the Tin which is made there is not so good as our Tin by 20s. in the hundred, nor can they afford to sell the same so cheap as £5 per cent."

He gives certain figures to show "the deplorable circumstances of the poor labouring Tinnners." He assumes 8,000 Tinnners, though he is satisfied that they much exceed that number, who with their families depend upon the product of their labour. All the tin coined in Cornwall in 1692 was by the Coinage Books of the Courts 11,174 Pieces, and the Coinage Duty thereof being 4s. a hundred in Cornwall amounted in that year to £5,449 17s. By which it doth appear that there must have been 27,249 hundred-weight of tin made that year in Cornwall only. And supposing that quantity sold at 50s. per cent. (which he says is about the present price) the whole product of Tin made in Cornwall in the year 1692 must come to £69,222 10s., which is a sum much inferior to the £200,000 a year and upwards which "some years before the Restauration when we had again the command of seas, that commodity of Cornwall yielded to the Tinnners calculated on the basis of £6 5s. a hundred Merchants' weight, clear of all Coinage Duties."¹⁸

The author then proceeds to compute the deductions from this sum of £69,222 10s., about a fifth part of which has to be paid to the Bounder and Lord of the soil, the charges of smith's work, timber, ropes and candles, which he estimates to each man in a year about 20s., the charge for dressing and stamping which he puts at 2s. 6d. to make every hundred of tin, the charges of refining that year's tin at 30s. the tide, computing one thousand of tin to be refined in each tide, the charges of carrying and the expenses of the refining or blowing house at 10s. the tide. The whole sum to be deducted comes to £28,884 9s. 10d., leaving clear to be divided amongst the 8,000 Tinnners but £40,338 0s. 2d. which comes to about £5 and 10d. and about half a farthing to each Tinner. "And this is all each Tinner hath to maintain himself and his family and for his whole year's hard labour not only under ground but under, God knows, how many grievances. But indeed they have been the better able to bear them as being the most Herculean and stoutest men upon earth, and for their most faithful and loyal services have the greatest privileges of liberty and property of any people in the Kingdom."

¹⁸ [The learned author here gives in a footnote some figures from Carew's Survey, but the reference is wrong, and we have been quite unable to reconcile his figures with any of the Survey, or with themselves. We, therefore, omit the note.—EDD.]

The Cornish factors and others are not the only causes of the poor tinnners' afflictions, against which it appears he might set off some of his great privileges. The Cornish lawyers do not escape castigation—"For as the Factors grind the poor Tinnners to gratify the principal Traders and thereby increase their commissions, so the Lawyers upon the discovery of a rich mine (taking the advantage of the Tinnners' ignorance of the Stannary Laws, they being not set forth and published in print),¹⁹ do use all means (by way of pretended Justice) to right those clients against the Bounder, the Landlord, or their fellow adventurers, when in truth it is in the main a contrivance to make themselves masters of these mines and the profits thereof and the Tinnners the Slaves to dig the Oar (*sic*) for them. And this they the sooner do because their Fees are so great and the Law Suits which they create so dilatory that (in proportion) they exceed all other grievances. Whereas the Tinnners' privilege (as I am informed) is to have their proceedings at Law altogether in English, and upon payment of a penny only they are at liberty to appear in person and to speak and act for themselves that their causes may be the sooner heard. Upon the whole it may be said that it is with the Tinner and his Tin as it is with the Spaniard and his Silver, and indeed the Tinner takes all the pain and others take away the profit."

The writer concludes his spirited pamphlet by a tabular statement of the amount of Tin coined in Cornwall in 1692 which was shipped off month by month at the Port of London for that year, with each merchant's name and the name of the several ports to which it was sent.

The other pamphlet is entitled "A State of the Proceedings of the Convocation or Parliament for the Stannaries of the County of Cornwall, held at Lostwithiel, on Tuesday, the 28th day of August, 1750, and at Helstone by Prorogation on Saturday, the 20th October following, and also the point in dispute between the Lord Warden and the House of Stanators (*sic*) impartially stated and fairly discussed Together with some

19. The author appears to be right here.

observations by a Cornish Man.²⁰ *Magna est veritas et prævalebit.*
London, MDCCII.”

The summoning of this Convocation was preceded by three petitions, two presented to Frederick, Prince of Wales, by the tanners (evidently the working tanners) of Cornwall, and one intervening petition to the lord warden praying his good offices in the matter. In the first petition to His Royal Highness the the following passage occurs “The relief which your Royal Highness’ progenitors have given to the Tanners and to this County and without which the Tin trade must have been utterly lost before this time to the men of this County has been by taking by way of Farm the Tin annually at a price certain, or by waving the Preemption, giving liberty for a Farm to be made.” And the petition to the lord warden concludes by earnestly desiring him to represent to His Royal Highness the low estate of his stannaries “to the end that . . . in compassion to our reduced circumstances he would be pleased to commissionate you as Warden of his Stannaries to summon or call before you in the ancient and accustomed manner a Parliament or Convocation of Tanners within the County of Cornwall for the reforming the abuses of the Stannaries, and for revising such old Laws and making such other additional new ones as may be thought necessary for His Royal Highness’ service and the benefit and encouragement of the Tanners within his said County, and that in the meantime for the support of the poor labouring Tinner and also to maintain the value of this staple commodity which this County of Cornwall doth afford beyond any other part of the world, he would vouchsafe to resume and effectuate his compassionate inclinations by taking a Farm of our tin at such a reasonable price conformably to former farms as may encourage the Tanners to carry on their adventures.”

The pamphlet sets out verbatim the Commission from the Prince, 16 June, 1750, and the accompanying Commission of Instructions.

20. Under the words “a Cornish Man” there is written in ink “Thomas Pitt.” Whether or not the pamphlet was actually written by the lord warden there can, I think, be no doubt that he had something to do with it. The proceedings are given in the greatest detail.

Accordingly Convocation was summoned to Lostwithiel, but unfortunately there seems to have been a general feeling amongst the Stannators in favour of Truro as the place of meeting and a message was sent to the lord warden, who was at Lostwithiel, to the effect that it would be for the dispatch of business to adjourn to Truro. The lord warden had a conference with the House and desired to know their reasons. The answer was that Truro was more in the heart of the tin country, to which the lord warden replied that though unconvinced by their reasoning he would, if the service of the county required it, give up his convenience and remove to Truro, but he thought if there was weight in their reasons Helston was more amongst the miners than Truro. Further discussion was put an end to by Convocation taking matters in their own hands and adjourning to Truro, and when the lord warden sent to desire another conference, he found the matter concluded and a resolution entered on the Journals that it was the undoubted right of the House to adjourn themselves to such time and place as they shall think fit. The lord warden was scandalized at this proposition, and said that it directly attacked the prince's prerogative as appears by the terms of the commission, and the Speaker replied in the presence of the Stannators present (some of them had already left the town) that he was empowered by them to engage that this resolution should at the next meeting be expunged from the Journals. The lord warden reported all that had happened to the prince, and the result was a proclamation adjourning the Convocation to *Helston*. Thither went in due course the lord warden and the stannators, but it was all in vain. The stannators refused to expunge the obnoxious resolution. Messages went to and fro for a week. The lord warden refused to receive the laws which the stannators tendered for his approval till the resolution was expunged. In their last message the stannators see no reason for continuing to sit till Monday (a day which had been named) unless his lordship intends then to receive the laws prepared by them. They desire his immediate answer, otherwise it is their resolution to adjourn forthwith. The lord warden replies that he is not prepared at present to say whether he will or will not receive the laws on Monday, but must take time to consider. Thereupon

the House adjourned themselves to a future day without sending any message to the lord warden. Thus ended this disastrous Convocation of which I have not before seen any notice, and which may well be forgotten.

Summary of Meteorological Observations at Truro, in Lat. 50° 17' N., Long. 5° 4' W., for the year 1904, from Registers kept at the Royal Institution of Cornwall, by the Curator, Mr. Geo. Penrose.

- 1904.		MONTHLY MEANS OF THE BAROMETER. Cistern 43 feet above mean sea level.																											
		Mean pressure corrected to 32 deg. Fahr. at sea level.		Mean of monthly means.		Mean correction for diurnal range.		True mean of monthly means.		Mean force of vapour.		Mean pressure of dry air.		Corrected absolute maximum observed.		Corrected absolute minimum observed.		Day.		Extreme range for the month.		Mean diurnal range.		Greatest range from 9 a.m. to 9 p.m.		Day.		Greatest range in any 24 consecutive hours.		Between which days it occurred.
Month.		ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
January		29.957	29.974	29.970	29.966	.004	29.962	.243	29.723	30.758	22	29.236	14	1.522	.135	.46	5	.56	29 & 30										
February		29.624	29.589	29.615	29.609	.003	29.606	.225	29.374	30.293	27	28.796	9	1.497	.153	.55	11	.73	15 & 16										
March		29.997	29.972	29.990	29.986	.007	29.979	.234	29.732	30.436	23	29.268	7	1.168	.113	.30	28	.40	7 & 8										
April		30.044	30.030	30.042	30.038	.004	30.034	.275	29.763	30.344	25	29.330	13	1.014	.091	.28	12	.56	11 & 12										
May	.....	29.981	29.974	29.976	29.977	.003	29.974	.309	29.663	30.251	19	29.630	7	0.921	.081	.28	2	.40	5 & 6									
June	.....	30.086	30.070	30.074	30.076	.001	30.075	.375	29.701	30.454	22	29.751	25	0.703	.079	.25	14	.44	23 & 24									
July	.....	30.039	30.027	30.037	30.044	.002	30.042	.427	29.617	30.293	8	29.658	26	0.635	.054	.28	19	.32	15 & 16									
August	.....	30.056	30.065	30.075	30.065	.004	30.061	.386	29.669	30.296	8	29.766	17	0.530	.069	.21	22	.29	17 & 18									
September		30.052	30.043	30.045	30.046	.004	30.042	.397	29.639	30.241	10	29.697	14	0.544	.081	.26	30	.41	11 & 12										
October		30.136	30.119	30.126	30.127	.006	30.121	.374	29.753	30.443	19	29.770	23	0.673	.091	.33	5	.46	7 & 8										
November		30.145	30.130	30.133	30.136	.004	30.132	.287	29.849	30.531	15	29.551	7	0.980	.091	.36	21	.59	7 & 8										
December		29.964	29.959	29.977	29.966	.003	29.963	.286	29.680	30.551	19	29.077	12	1.474	.109	.33	12	.50	11 & 12										
Means	...	30.006	29.996	30.007	30.003	.004	29.999	.317	29.634	30.407		29.450		0.946	.095	.32		.47											

REMARKS.—The Barometer used is a Standard, made by Barrow, and compared with the Standard Barometer at the Royal Observatory, Greenwich, by Mr. Glaisher. The corrections for Index Error (+0.008), Capillarity (+0.103), height above sea (43 feet), and temperature, have been applied.

TABLE No. 2.

MONTHLY MEANS OF THE THERMOMETER																													
1904.	MASON'S HYGROMETER.												SELF REGISTERING.		ABSOLUTE.														
	9 a.m.		3 p.m.		9 p.m.		Mean of Dry Bulb.	Mean correction for diurnal range.	True mean of Dry Bulb.	Mean of Wet Bulb.	Mean correction for diurnal range.	Mean temp. of evaporation.	Wet Therm. below dry.	Mean dew point.	Dew point below Dry Therm.	Mean of all the Maxima.	Mean of all the Minima.	Approximate mean temp. for the month.	Corrected mean temp.	Adopted mean temp.	Daily mean range.	Maximum.	Day.	Minimum.	Day.	Range.			
January	0	44.7	0	42.6	0	46.7	44.6	0	44.5	0.4	0	43.0	0.3	42.7	1.8	39.6	4.9	0	48.6	38.5	43.5	0.1	43.4	10.0	53.5	15	28.2	23	25.3
February	0	44.0	0	41.4	0	45.7	43.2	44.9	0.7	44.8	0.7	41.9	0.5	41.4	2.7	37.5	6.6	0	47.4	38.1	42.8	0.1	42.7	9.3	53.8	22	30.0	29	23.8
March	0	44.5	0	41.3	0	47.9	44.5	44.9	1.0	43.9	1.0	42.2	0.6	41.6	2.3	38.6	5.3	0	49.8	36.7	43.2	0.2	43.0	13.1	59.5	9	26.0	27	33.5
April	0	51.0	0	47.3	0	53.6	49.3	50.6	1.6	49.0	1.6	47.5	1.3	46.2	2.8	42.8	6.2	0	56.6	43.5	50.1	0.1	50.0	13.1	66.5	19	34.0	11	32.5
May	0	55.0	0	51.2	0	57.7	53.5	54.6	2.3	52.3	2.3	51.3	1.4	49.9	2.4	45.9	6.4	0	60.4	45.9	53.2	0.8	52.4	14.5	71.0	29	35.0	1	36.0
June	0	59.9	0	54.8	0	62.3	57.4	58.5	2.9	55.6	2.9	54.8	1.7	53.1	2.5	51.1	4.5	0	66.6	48.5	57.6	0.3	57.3	17.3	72.0	23	39.0	10	33.0
July	0	65.6	0	60.5	0	67.7	61.7	64.4	2.1	62.3	2.0	60.0	1.2	58.8	3.5	54.6	7.7	0	71.7	55.0	63.3	0.3	60.0	16.1	84.0	17	43.0	8	41.0
August	0	63.2	0	58.7	0	66.0	59.9	62.1	2.0	60.1	2.0	58.0	1.2	56.8	3.3	52.5	7.6	0	68.7	52.6	62.7	0.3	62.4	16.1	77.0	3	41.0	21	36.0
September	0	59.7	0	55.6	0	62.4	57.6	58.7	1.7	57.0	1.7	55.2	0.9	54.3	2.7	51.2	5.8	0	65.5	49.1	57.3	0.2	57.1	16.4	69.0	17	38.0	26	31.0
October	0	54.9	0	52.6	0	57.7	54.8	54.7	0.8	53.9	0.8	52.6	0.6	52.0	1.9	51.0	2.9	0	59.8	46.3	53.0	0.4	52.6	13.4	65.0	11	34.0	26	31.0
November	0	46.2	0	44.7	0	50.9	48.4	47.2	0.6	46.6	0.6	45.5	0.5	45.0	1.6	43.9	2.7	0	53.5	38.6	46.0	0.1	45.9	14.8	63.0	5	20.0	27	43.0
December	0	48.5	0	47.0	0	49.7	48.9	48.2	0.2	48.0	0.2	47.0	0.3	46.7	1.3	43.8	4.2	0	51.8	42.1	47.0	0.2	46.8	9.6	56.0	16	32.0	3	24.0
Means	0	53.1	0	49.8	0	55.6	51.9	52.8	1.3	51.4	1.3	49.9	0.9	49.0	2.4	46.0	5.4	0	58.3	44.5	51.6	0.3	51.1	13.6	65.8		33.3		32.5

The thermometers are placed on the leaded roof of the Royal Institution in a wooden shed, through which the air passes freely. The Standard wet and Dry Bulbs are by Negretti and Zambra, with Kew Certificates.

TABLE No. 3.

1904.		WINDS.																																		
		E.			S.E.			S.			S.W.			W.			N.W.			N.			N.E.			AVERAGE FORCE.										
		9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.	9 a.m.	3 p.m.	9 p.m.								
January	4	4	2	6	6	1	3	3	4	5	4	1	1	3	9	9	2	1	1	0	1	1	1	1	1	23	22	13	20							
February	2	2	2	8	7	5	2	2	3	3	1	6	11	9	4	4	3	2	2	1	1	0	0	0	0	30	38	28	34							
March ...	4	5	6	5	8	4	2	1	3	1	2	2	4	2	3	2	1	3	3	3	9	5	2	2	30	30	18	26								
April ...	1	1	0	2	3	1	0	0	2	3	3	8	8	6	8	11	3	6	4	4	0	0	0	0	38	40	21	33								
May ...	4	3	0	7	6	4	2	2	2	4	7	5	8	7	5	5	4	1	1	1	0	0	1	1	34	30	14	26								
June	6	4	1	6	8	3	1	1	0	3	3	2	3	2	11	10	0	1	1	1	0	0	1	0	28	30	10	22								
July	4	3	2	6	8	4	4	5	5	4	2	6	7	3	4	6	2	0	0	0	1	0	0	1	27	31	15	24								
August ...	0	0	0	6	6	2	5	3	5	3	3	4	10	6	8	8	1	3	1	1	0	0	0	0	24	28	11	21								
September	5	4	4	3	4	3	1	0	4	5	7	4	3	3	1	6	6	2	2	0	2	3	2	3	32	35	17	28								
October ...	3	4	0	3	4	3	2	1	0	2	3	2	6	1	8	7	3	3	3	1	3	3	4	3	23	29	13	22								
November	2	4	1	1	2	1	1	0	0	0	0	2	5	6	4	4	7	2	5	5	4	1	5	1	14	22	10	16								
December	2	4	6	7	4	3	6	5	3	1	3	5	2	5	3	3	5	3	2	5	1	0	0	0	26	24	19	23								
Total	37	38	24	60	66	34	29	23	31	34	39	49	49	71	45	78	80	24	29	28	17	18	17	12	32	39	35	18	29							
Means ...	33.0			53.3			27.7			40.6			55.0			60.6			28.0			15.6			27			29			15			24		

The force of the Wind is estimated on a scale from 0 to 12, from calm to violent storm

TABLE No. 4.

1904.		WEATHER.																							
		AVERAGE CLOUDINESS.		RAINFALL.				Mean additional weight required for saturation of the air.		Mean humidity of atmosphere.		Mean weight of vapour in a cubic foot of air.		Total hours of Bright Sunshine.		No of Days on which the sunshone.		Average Daily sunshine.		Dry.		Wet.		REMARKS.	
				Rainfall in inches.		Greatest fall in 24 hours.																			
Month.		9 a.m.	3 p.m.	9 p.m.	Mean.	Truro.	No. of days on which rain fell.	Depth.	ins.	gms.	gms.	gms.	gms.	in	gms.	gms.	gms.	hrs.	hrs.	Dry.	Wet.				
January		6.8	7.2	5.4	6.4	6.01	25	.68	9	2.8	0.5	84	.244	533.3	56.5	18	1.8	73	20			Gale, 2, 14, 26, 27, 29. Hail, 14, 15, 31. Frost, 4, 5, 22, 23. Thunder & Lightning, 1, 3, 4, 8, 10, 11, 12, 22. Thunder & Lightning, 1, 3, 4, 8, 10, 11, 12, 22. Thunder & Lightning, 1, 3, 4, 8, 10, 11, 12, 22. Thunder & Lightning, 1, 3, 4, 8, 10, 11, 12, 22.			
February		6.7	8.0	6.7	7.1	8.11	23	.92	16	2.6	0.7	77	.224	533.4	56.3	22	1.9	67	20			Gale, 8. Hail, 5, 6, 8, 11, 13, 14, 15, 16, 17, 20. Frost, 1, 29. Fog, 1, 4, 6, 10, 19. Lightning, 8, 9, 12, 13. Lunar Halo, 24.			
March	...	7.0	6.8	5.8	6.5	2.25	12	.63	7	2.7	0.5	84	.234	534.4	97.5	24	3.1	78	15			Gale, 29, 30. Hail, 29, 30. Snow, 1, 4, 25. Frost, 1, 2, 4, 11, 12, 13, 16, 27. Fog, 3, 4, 12, 20. Lightning, 20.			
April	.....	6.5	4.8	6.1	5.8	1.41	16	.37	13	3.1	0.9	79	.276	527.8	179.2	27	5.9	81	9			Gale, 1, 2, 3, 8. Hail, 1, 13. Fog, 8, 24.		
May	.....	7.2	5.9	6.3	6.4	2.63	18	.48	23	3.8	0.6	86	.335	524.4	165.3	26	5.3	75	18			Hail, 6, 8. Sleet, 8. Thunder & Lightning, 30.		
June	.....	6.6	4.1	2.7	4.4	1.47	8	.48	14	4.2	0.7	87	.375	521.0	216.3	26	7.2	85	5			Gale, 13. Thunderstorm, 11. Thunder and Lightning, 19. Remarkable kab, 1, 7, 10 ins		
July	.....	6.1	5.7	5.1	5.6	5.24	17	1.70	22	4.7	1.5	77	.427	513.7	197.2	29	6.3	88	5					
August	...	6.0	4.9	3.0	4.6	2.28	15	.51	16	4.4	1.4	76	.395	515.9	223.6	30	7.2	84	9			Gale, 5, 17, 18, 19, 20. Fog, 15.			
September	...	4.5	4.4	4.4	4.4	2.15	14	.49	30	4.2	1.0	81	.377	519.0	174.8	28	5.8	79	11			Gale, 7. Fog, 4, 11, 12. Thunder & Lightning, 15.			
October	...	6.7	6.5	5.9	6.3	2.49	19	.58	2	4.2	0.3	93	.374	523.1	98.4	21	3.1	80	13			Gale, 7, 8. Hail, 21, 22, 25. Snow, 24. Sleet, 23. Fog, 2, 3, 15, 16, 17, 18, 19, 20. Frost, 25, 24, 25, 26, 27, 28. Thunder & Lightning, 25.			
November	...	6.3	6.3	5.4	6.0	2.39	18	.63	25	3.3	0.3	93	.287	530.9	59.5	22	1.9	81	9			Hail, 16. Frost, 3. Fog, 3, 6, 9, 13, 18, 19, 25. Lunar Halo, 21.			
December	...	7.5	6.7	5.9	6.7	4.29	18	.70	13	3.3	0.5	86	.285	528.8	59.1	20	1.9	75	18						
Means	...	6.4	5.9	5.2	5.8	40.72	203*	0.67		3.6	0.7	83	.319	525.4	1683.7	293*	4.2	78	13						

* Totals. The sunshine is taken by a Jordan's Photographic-Sunshine Recorder, presented by J. D. Enys, Esq., F.G.S. The rain gauge is placed on the flat roof of the Royal Institution, at about 40 feet from the ground. Cloudiness is estimated by dividing the sky into ten parts, and noting how many of these are observed.

SUMMARY OF METEOROLOGICAL OBSERVATIONS AT TREWIRGIE, REDRUTH.

Latitude 50° 13' 44" N.

BY ARTHUR P. JENKIN, Esq.

Longitude 5° 13' 48" W

1904.	MASON'S HYGROMETER.					THERMOMETER ABSOLUTE.							RAINFALL.			CLOUD.	WIND.			REMARKS.									
	Month.	Mean of Dry Bulb.	Wet Ther. below dry.	Mean Dew Point.	Relative humidity.	Maximum.	Day.	Minimum.	Day.	Range.	Mean of all the Minima.	Mean of all the Maxima.	Approximate mean temperature.	Monthly mean range.	Total depth.	Number of rainy days.	Greatest fall in 24 hours.	Date.	Mean amount at 9 a.m.		Relative Proportion of.								
																					N.	S.	E. W						
January	42.9	41.7	1.2	40.2	90	51.4	13	31.1	23	20.3	46.6	38.8	42.7	7.8	7.49	26	0.75	2	7.4	—	—	—	—	—	—	—	Gale, 2, 13, 14, 27, 29. Hail, 3, 9, 13, 14, 15, 16, 25, 30, 31. Fog, 7, 11, 18. Thunder and Lightning, 19, 14.		
February	41.3	39.5	1.9	37.1	85	50.1	12	28.1	29	22.0	45.3	37.0	41.1	8.3	7.56	23	1.07	2	7.6	—	—	—	—	—	—	—	—	Hail, 2, 4, 5, 6, 8, 10, 13, 15. Snow, 15, 16, 17, 20. Gale, 12, 13, 14, 16, 20. Lightning, 8. Lunar Halo, 24.	
March	41.9	40.0	1.9	37.6	85	54.6	9	28.5	2	26.1	46.6	36.2	41.4	10.4	2.86	17	0.97	7	6.9	—	—	—	—	—	—	—	—	Snow, 1, 2, 4, 23. Thunder, 9. Lightning, 20. Hail, 20, 30.	
April	48.0	45.6	2.4	42.9	82	57.9	19	30.9	11	21.0	51.9	42.5	47.2	9.4	1.71	17	0.54	13	6.7	—	—	—	—	—	—	—	—	Gale, 2, 7. Fog, 8, 24, 27, 29. Hail, 13.	
May	51.8	49.7	2.1	47.7	86	67.1	16	34.7	9	32.4	56.6	45.1	50.8	11.5	3.30	19	0.73	23	7.8	—	—	—	—	—	—	—	—	Snow, 8. Fog, 2, 3, 11, 13, 26, 27. Hail, 6, 8.	
June	56.8	53.5	3.3	50.4	80	68.2	29	42.4	10	25.8	61.1	49.1	55.1	12.0	1.60	10	0.46	14	7.0	—	—	—	—	—	—	—	—	—	Snow, 8. Fog, 2, 3, 11, 13, 26, 27. Hail, 6, 8.
July	62.6	59.1	3.5	56.2	80	75.1	10	45.8	8	29.3	67.1	54.4	60.8	12.7	4.60	21	1.05	22	6.6	—	—	—	—	—	—	—	—	—	Gale, 11, 18. Thunderstorm, 11. Thunder & Lightning, 18, 19.
August	60.4	57.3	3.1	54.6	81	73.0	3	47.7	21	25.3	64.4	53.4	58.9	11.1	2.93	19	0.60	21	7.1	—	—	—	—	—	—	—	—	—	Gale, 11, 17, 18, 19, 20.
September	57.0	54.1	2.9	51.5	82	67.1	29	42.8	22	24.3	61.5	50.1	55.8	11.4	2.68	15	0.61	13	5.7	—	—	—	—	—	—	—	—	—	Fog, 5, 17. Thunderstorm, 18.
October	52.6	51.1	1.5	49.6	90	62.7	10	41.7	26	21.0	56.9	47.5	52.2	9.4	2.53	22	0.55	2	7.3	—	—	—	—	—	—	—	—	—	Gale, 7, 9. Fog, 16, 18. Hail, 21, 22, 25. Snow, 23, 24. Thunder & Lightning, 22.
November	46.1	44.6	1.5	42.8	88	57.0	13	27.3	24	29.7	50.5	41.2	45.9	9.3	3.56	20	0.63	25	7.3	—	—	—	—	—	—	—	—	—	Hail, 7, 10, 12. Fog, 19.
December	46.0	44.9	1.1	43.7	91	53.3	4	34.0	11	19.3	49.3	42.2	45.7	7.1	4.79	24	0.70	13	7.6	—	—	—	—	—	—	—	—	—	Hail, 7, 10, 12. Fog, 19.
Means	50.6	48.4	2.2	46.2	85	61.5		30.7		24.7	54.8	44.8	49.8	10.0	45.61	233	*		7.1	—	—	—	—	—	—	—	—	—	

Totals.*

Readings taken at 9 a.m. local time. All instruments with Kew Certificates, and where applicable are placed in a Stevenson Screen. Height above sea levelled from Ordnance Bench Mark 308 feet. Top of rain gauge 1 foot above ground. Wind is calculated as follows—N = 4 N. W. = 4 W. S. W. = 2 S. W. = 2 W. W. S. W. = 3 W. S. and so forth.

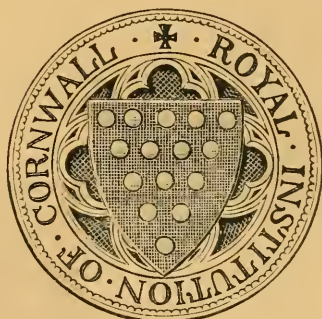
COMPARISON OF RAINFALL IN THE NEIGHBOURHOOD.

1904.	J. C. DAUBUZ, Esq., Killiw.				W. J. LEAN, Esq., Truro Water Works.				H. TRESAWNA, Esq., Lamellyn, Probus.				GEO. PENROSE, Royal Institution of Cornwall.					
	Total depth.		Greatest fall in 24 hours.		No. of days on which 'or more fell.		Total depth.		Greatest fall in 24 hours.		No. of days on which 'or more fell.		Total depth.		Greatest fall in 24 hours.		No. of days on which 'or more fell.	
	Inches	Date	Depth	Date	Inches	Date	Inches	Date	Inches	Date	Inches	Date	Inches	Date	Inches	Date	Inches	Date
January ...	6.23	.75	26	9	6.03	.69	9	24	5.93	.58	9	23	6.01	.68	9	25		
February ...	8.02	.94	12	16	7.88	.95	16	21	7.30	.70	16	26	8.11	.92	16	23		
March ..	2.60	.55	8	7	2.51	.68	7	17	2.60	.60	7	10	2.25	.68	7	12		
April ...	1.62	.53	13	13	1.33	.30	13	15	1.32	.27	13	11	1.41	.37	13	16		
May ...	2.64	.49	1	16	2.80	.55	23	19	2.98	.63	23	14	2.63	.45	23	18		
June ...	1.58	.47	14	8	1.45	.38	14	7	1.93	.70	7	7	1.47	.48	14	8		
July ...	5.53	1.65	22	13	5.63	1.67	22	14	5.25	1.58	22	14	5.24	1.70	22	17		
August ...	2.52	.55	16	16	1.97	.52	21	8	2.40	.43	16	13	2.28	.51	16	15		
September	2.13	.40	11	14	2.25	.52	30	9	2.39	.58	6	12	2.15	.49	30	14		
October ...	2.63	.65	2	20	2.61	.71	5	16	2.38	.43	2	14	2.44	.58	2	19		
November	3.00	.70	25	16	2.51	.49	23	11	2.54	.70	25	13	2.39	.63	25	18		
December...	4.71	.73	8	22	3.96	.75	13	16	4.46	.73	8	19	4.29	.70	13	18		
TOTAL ...	43.21				40.93			177	41.48			176	40.72			203		

JOURNAL

OF THE

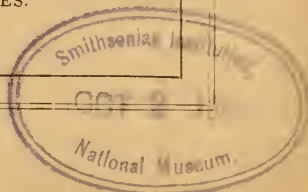
Royal Institution of Cornwall.



VOLUME XVI.

Part 3.—1906.

TRURO:
OSCAR BLACKFORD, ROYAL PRINTERIES.
1906.



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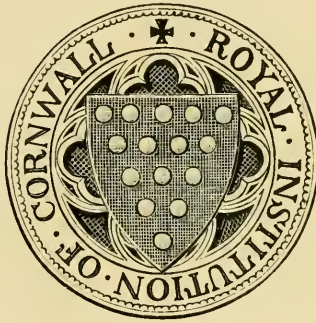
Tho'Kell & Son

SIR E. DURNING-LAWRENCE, BART., M.P.
PRESIDENT 1903-5.
ROYAL INSTITUTION OF CORNWALL.

JOURNAL

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The Council of the Royal Institution of Cornwall desire that it should be distinctly understood that the Institution as a body is not responsible for any statements or opinions expressed in the Journal; the Authors of the several communications being alone answerable for the same.

Royal Institution of Cornwall.

—◆—
 SPRING MEETING, 1905.
 —◆—

The Spring Meeting of the members of the Institution was held at Truro on Tuesday the 23rd May, 1905. Mr. J. D. Enys, F.G.S., presided in the absence through ill-health of the president, Sir Edwin Durning-Lawrence, Bart., M.P. There were also present Revs. St. A. H. Molesworth-St.Aubyn, S. Rundle, D. G. Whitley, Philip Carlyon, T. M. Comyns, and P. E. Browne. The Mayor of Truro (Mr. W. F. Clarke), Dr. W. Hammond and Dr. Cholmeley; Messrs. Horton Bolitho, W. H. Barlow, F.I.C., J. Bryant, F. Blatherwick, J. R. Collins, J. H. Collins, F.G.S., F. A. Cozens, E. Crawley, T. L. Dorrington, R. Dixon, E. H. Davison, R. Dobell, W. G. N. Earthy, D. E. Graves, G. E. Graves, H. G. Henderson, H. James, S. Jones, A. P. Jenkin, J. Morrish, J. R. Paul, T. C. Peter, W. A. Rollason, R. H. Williams, and E. F. Whitley; Mesdames Cornish, Cholmeley, Crawley, Dixon, Dorrington, Henderson, Molesworth-St.Aubyn, Paull, Rollason, and Share; The Misses Dixon, Henderson, Holland, James, L. Paull, Peter, M. Peter, Share, Truran, and Williams; the Rev. W. Iago, and Major Parkyn, F.G.S. (honorary secretaries), and Mr. George Penrose (curator).

Major Parkyn read the minutes of the last meeting (22nd November, 1904) and, after same were confirmed, stated that he had received the following letter from the president:—"Will you kindly express to our friends my great regret at my enforced absence. I had looked forward to the pleasure of personally presenting my address, which now I must ask you to depute someone to be good enough to present. Nobody will be more sorry on Tuesday than myself that I am not present."

It was decided to send the following telegram to Sir Edwin:—"The members of the Royal Institution of Cornwall, assembled for their spring meeting, desire to express their unfeigned regret at your enforced absence, and sincerely hope to hear very soon of your complete recovery."

During the afternoon the following reply was received:—
“Sir Edwin and Lady Durning-Lawrence thank their friends very much for their sympathy, and heartily reciprocate kind wishes and send greetings.”

Letters of apology were also received from the Rev. Sir Vyell Vyvyan, Bart., Rev. Canon S. R. Flint, Dr. J. Clark, Dr. R. Pearce, Capt. Rogers, R.A., Messrs. Robert Fox, James Osborne, C.E., W. N. Carne, and F. H. Davey, F.L.S.

Mr. Enys said: Shortly after our meeting in December last it was announced that one of our members, Mr. T. V. Keam, a native of Truro, but one who had spent some 30 years in the United States, had died and left a legacy to the Institution, which when realized would be worth probably from £4,000 to £5,000. Mr Keam took a great interest in the Institution and presented many valuable gifts to the museum. During his last visit to this country he frequently visited the museum and made valuable suggestions as to improvements that might be made.

Many persons have naturally inquired as to the purpose to which this money will be applied. Some have suggested extension of our premises; but with additional premises there would of necessity be additional expense, and the income of the Institution is not sufficient for the proper maintenance of the present building. It would be very unwise, therefore, to undertake any further liability such as would be caused by an additional building without a corresponding increase in our income. Under all the circumstances, therefore, the Council think that the legacy when received should be invested and known as the “Keam” Fund, and the interest applied for the purpose of general maintenance.

But it is now recognised that museums play an important part in the general education of the people. In this county the Royal Institution has proved itself of great benefit to the community, several thousands of persons annually availing themselves of its advantages.

In order that the usefulness of the museum as an educational institution may be further increased to meet growing demands, and with a view to the proper accommodation of the valuable collections that have accumulated since our foundation in 1818,

we are faced with the fact that an extension of premises is becoming an absolute necessity. The matter has caused the Council a considerable amount of anxiety, and a sub-committee specially appointed for the purpose met to consider the possibility of acquiring some portion of the adjoining property. It was found that extension was possible in two directions—towards Pydar Street or towards the High Cross. The latter direction was considered the most suitable, as the principal entrance could be from the High Cross, and the museum would be well under the observation of the people, being in touch with one of the main parts of the city. The museum now suffers owing to its not being in a more prominent position.

It appearing that arrangements were about to be made by Viscount Clifden to grant a long lease of the premises in the High Cross, and that, if the Institution wished to acquire them with a view to their being added to the museum so soon as funds should permit, it was necessary to secure them almost immediately, the Council have entered into an arrangement for their purchase.

Until funds permit of a suitable building being erected on the site, it is proposed to retain the present shops as an investment of a part of the Kean trust moneys.

Many valuable gifts have been made to the museum. In response to the appeal for new cases Mr. J. C. Williams has generously consented to give six at a cost of nearly £200, and these are now being installed and will be in order before the end of the year. There are still six more wanted to complete the set of fourteen for the mineral collection.

Mr. Alderman Dorrington has presented two valuable copper plates of the exterior and interior of old St. Mary Church, Truro, which were engraved by F. Lewis from sketches made by William Varley in 1806; also a copper plate of Truro from Kenwyn in 1806, showing the old cavalry barracks which were taken down in the early part of the last century.

Sir Edwin Durning-Lawrence has presented Varley's original sketch of the exterior of the old St. Mary Church, from which the plate given by Mr. Dorrington was engraved.

The late Mr. T. H. Hodge bequeathed a portrait of his grandfather, Mr. Blee, of Truro, said to have been painted by

John Opie, and the Earl of Mount Edgecumbe has sent the fragments of a second cinerary urn found at Treworrick, St. Ewe.

For many years past there has been a general desire that whenever an extension of premises was possible, provision should be made for the incorporation of an art gallery with the museum. Scattered throughout the building may be found many valuable objects of arts, which when collected together would form a suitable nucleus, and as soon as space is available special attention will be paid to the working up of this important branch.

The direct object of the Institution should be to build up a county museum and art gallery worthy of Cornwall, and an effort should be made to secure works of art by such men as the president has referred to in his address. The museum should be placed on such a footing as to insure an annual income which would permit of its being open to all free at all times. I venture to think that the teachers of our elementary schools would find it well worth their while to pay occasional visits to our museum, and that the school authorities might advantageously arrange for visits by the children, who shall receive simple explanations of the interesting articles collected there.

Mr. Thurstan C. Peter then read the President's address, "Cornish Scenery and the Artists who have painted it."

Mr. H. G. Henderson, Principal of the School of Mining, Truro, introduced his invention for map modelling or the construction of maps in relief and exhibited a series of very interesting relief maps constructed on this new system.

Rev. D. G. Whitley spoke of his visits to Luxulyan Valley, which he considered about the most interesting district in the whole of Cornwall. It was much to be desired that someone would make an effort to collect the old traditions and the information which could be given of the various points of interest, together with the old stories of the aged tanners connected with the place. It would repay anyone for the trouble and time.

Mr. G. Penrose read "Notes on Cornish Birds, 1904-5," prepared and forwarded by Dr. J. Clark, from St. Goar.

On the motion of Messrs. J. R. Collins and T. L. Dorrington, a vote of thanks was accorded the president for his address, the contributors of papers, and donors of gifts to the Institution. Mr. Enys was thanked for presiding, on the motion of the Mayor of Truro and the Rev. St. A. H. Molesworth-St Aubyn.

Royal Institution of Cornwall.

THE PRESIDENT'S ADDRESS.

Cornish Scenery—The Artists who have Painted it—The Newlyn School—Some Cornish Artists.

We are justly very proud of our magnificent Cornish scenery, and every year more and more people are coming to the far west and every year better railway travelling and increased accommodation is provided for them. But a little more than a hundred years ago Gilpin, the author of "Forest Scenery," in his "Tour in the West of England,"¹ seems to see no beauty in Cornwall, to which he devotes only the following short mention :

"From Launceston we travelled as far into Cornwall as Bodmin, through a coarse, naked country, and in all respects as uninteresting as can well be conceived. Of wood, in every shape, it was utterly destitute.

Having heard that the country beyond Bodmin was exactly like what we had already passed we resolved to travel no farther into Cornwall; and instead of visiting the Land's End, as we had intended, we took the road to Lescard, proposing to visit Plymouth in our return."

And in this way Mr. Gilpin finished with Cornwall! But now, perhaps in some measure owing to Wilkie Collins' "Rambles beyond Railways," written in 1851, how different is public sentiment to-day! We are no longer insensible to the impressive grandeur of the bleakest and wildest moorlands. Indeed, speaking for myself, I enjoy immensely the wide stretches where the Cornish heath has its home. Yes, now that time has softened some of the ruggedness of the old scoria

1. The full title of this book is "Observation on the Western parts of England, relative chiefly to picturesque beauty," by Tom Gilpin, M.A. (London. 1798.) The passage in the text is from Section XIX.

heaps, I love those parts of the country also, and I think that the old disused and dismantled engine houses and chimneys at the closed mines add a peculiar, weird, strange look, characteristic of the Duchy.

But the Cornish mainland is not all flat, bleak moors and regions of desolation, for these are intersected by a vast number of little valleys technically called "Combes," which generally run nearly due east and west down to the sea, forming veritable traps to catch the beams of the setting sun, which at times lends to them a glory and a charm that it would be almost impossible to match elsewhere. These "Combes" have been so grandly described by Charles Kingsley in "Westward Ho" that I must quote his words, since anything I could write would be indeed tame and poor in comparison with them,

"Each is like the other, and each is like no other English scenery. Each has its upright walls, inland of rich oak wood, nearer the sea of dark green furze, then of smooth turf, then of weird black cliffs, which range out right and left far into the deep sea, in castles, spires and wings of jagged ironstone. Each has its narrow strip of fertile meadow; its crystal trout stream winding across and across from one hill foot to the other; its grey, stone mill, with the water sparkling and humming around the dripping wheel; its dark rock-pools above the tide-mark, where the salmon gather in from their Atlantic wanderings after each autumn flood; its ridge of blown sand, bright with golden trefoil and crimson lady's finger; its grey bank of polished pebbles, down which the stream rattles toward the sea below. Each has its black field of jagged shark's tooth rock, which paves the cove from side to side, streaked with here and there a pink line of shell sand, and laced with white foam from the eternal surge, stretching in parallel lines out to the westward, in strata set upright on edge, or tilted towards each other at strange angles by primeval earthquakes. Such is the "mouth" as those coves are called, and such the jaw of teeth which they display, one rasp of which would grind abroad the timbers of the stoutest ship.

To landward, all richness, softness and peace; to seaward, a waste and howling wilderness of rock and roller, barren to the fishermen and hopeless to the shipwrecked mariner."

Under skilful gardening many of these "combes," or rather the softer valleys that take their place, in the neighbourhood of Falmouth, support magnificent palm trees and vast quantities of almost every species of sub-tropical vegetation, which elsewhere cannot be successfully cultivated out of doors. But I must now pass on to the most popular portion of the scenery of Cornwall, its matchless coasts, for we must remember it has a north and south, and I might almost say an east and a west sea coast. It is these coasts, of which every bay possesses a special charm of its own, that now prove so attractive to the tourists and travellers who are gradually "discovering" the county.

In the calmest weather the mighty rollers of the Atlantic Ocean strike fiercely against the barren rocks of the Land's End and the Lizard, and in anything approaching to a storm their force is so great that it almost seems as if nothing could resist their power. In Cornwall the artist can be certain of finding seas of nearly every colour and every mood. In the south, every ripple reflects the rays of the sun and every "white horse" is glorified by his beams, while on the north coast the deep, sombre blue of the water possesses a peculiar charm of its own which is very attractive when cleverly put upon canvas.

I reserve for a later stage all mention of the deceased native-born Cornishmen that I have been able to discover who, prior to the foundation of the Newlyn School, devoted their talents to art. I must state, however, that few, if any, of the more distinguished of these turned their attention to portraying the beauties of their own county. But I must speak of the artists not of native birth, commencing with Turner, who, at the beginning of the last century, painted in his matchless manner Saltash, St. Mawes, Fowey Harbour, St. Michael's Mount and The Land's End, which were widely disseminated by engravings published in the "Picturesque Views of England and Wales." In addition to these, Turner made a large number of other pictures of Cornwall, but I mention these as specially familiar to all through popular engravings.

Since Turner showed the way the trouble is to say not what artist has painted views of Cornwall, but what artist has not. Maclise, who did but little in landscape painting, made use of St. Nectan's Kieve (not very far from Tintagel) as part of his picture of "The Waterfall," and not far away was the little mill which was long known as "Creswick's Mill." John Varley drew a good many views of the county. J. C. Hook, R.A., has for half-a-century painted glorious views of the sea, including dozens of pictures representing Cornish coast scenery. John Brett entered the Academy (it was supposed) on his views of the Cornish Lions and Kynance Cove. Lord Leighton did not disdain to draw some sketches of Cornwall. There is rarely an Academy exhibition without at least twenty views of Cornish scenery, and in the present exhibition many people consider Mr. B. W. Leader's "Cornish view" as his best picture of the year. But Mr. Napier Hemy, who lives at Falmouth and does much of his work from his floating studio "The Vandermeer," easily at the present time takes the foremost place as painter of the seas, and especially of Cornish seas, so I think it will not be without interest if I say a few words about him and his work. I like to get things first hand, so I wrote to Mr. Hemy, and he referred me to an account of himself written by Mr. Arthur Fish and published in the "Magazine of Art," November, 1899. I have no intention of writing a biography of Mr. Hemy, but merely to mention that he settled at Churchfield, Falmouth, in 1883, after having achieved his first great success in 1880 with a picture called "Saved," representing stormy weather at the entrance of the small harbour of Littlehampton. From the time of his settling in Cornwall his progress has been rapid and his success most marked. At first he sketched from an open boat, then he put a sort of cabin studio in an old seine boat which he called the "Vandervelde," but that was nearly wrecked in 1888 and now stands high and dry in the garden of Churchfield, and has been succeeded by the fine studio yacht which he built and called the "Vandermeer." In 1897 he exhibited two magnificent works, one entitled "Lost," a swamped seine boat in a turmoil of waters, the other the well known "Pilchards," that was purchased by the Council with the Chantry bequest funds for £1,200 and now hangs in the Tate Gallery. Mr. Hemy,

after exhibiting these two pictures, was almost immediately elected an Associate Member of the Royal Academy, and since that time has gone on from success to success. In the present year he again shews, among others, two remarkable pictures "Betrayed by the Moon," and "Escape of the Destroyer," each of which shews mighty battleships surging through the dark water in a manner that commands the admiration of all acquainted with the sea. But I must not be tempted to say more about this great artist who confers distinction on our county, except to record that Charles Napier Hemy, A.R.A., was born at Newcastle in 1841, commenced serious artistic work about 1863 and in 1866 went to Antwerp to study under Baron Leys; he left Antwerp in 1870 for London where he lived till 1881, when he travelled abroad and finally settled in Falmouth in 1883. He was made A.R.A. in 1898.

I must now refer to the artists who established themselves about 20 years ago at the small village of Newlyn, near Penzance, and are now known as the Newlyn School, with whom I shall also mention the other and much smaller band of artists who established themselves not far off on the northern coast and are known as the St. Ives School. At its commencement, I think no one can dispute that the Newlyn School was in its origin a revolt from the British School to the French School and its "creed" is said to have been "strict adherence to realism in choice and treatment of subject," "the subordination of colour to tone-gradation," "the exclusive use of flat brushes," "the laying on of pigments in square touches," and certain other similar special maxims. Of course, time and experience have very much modified these hard-and-fast rules, but the Newlyn painter to-day works from a live fisherman as he actually exists and not from a dressed up model or the doll called a "lay figure." Edwin Harris, it is supposed, "discovered" Newlyn; he was joined by Walter Langley, who still lives near Newlyn. Then came Ralph Todd, L. Suthers, Fred Hall, Frank Bramley (now A.R.A.), and J. C. Gotch, to be followed by Percy Craft, together with Stanhope Forbes (now A.R.A.), and the acknowledged leader of the School. H. Detmold and Chevallier Taylor next, then Miss Elizabeth Armstrong (now Mrs. Stanhope Forbes), F. Bourdillon, W. Fortescue and Norman Garstin, then,

somewhat later, Ayerst Ingram, H. S. Tuke (now A.R.A.), H. Martin and F. Millard. It will be noted that among these there are three who are now Associate Members of the Royal Academy, and of those not so selected several have achieved world-wide repute. It may be worth recording here that of the above list of artists twelve shew pictures in the present exhibition (1905) at Burlington House, although for the most part these pictures are not views of Cornish scenery, since nearly all of the original band have now left the neighbourhood of Newlyn excepting the first comer, Walter Langley, and Mr. and Mrs. Stanhope Forbes, both of whom are greatly distinguished as artists of the highest aims. Mr. Stanhope Forbes was trained in the Lambeth School of Art, then at the Royal Academy and afterwards at Bonnat's Studio in Paris, and first came into notice through his Breton pictures. From Brittany he came to Newlyn and almost immediately achieved success with his picture "A Fish Sale on the Cornish Coast," which was exhibited in 1885; seven years later, in 1892, he was elected an Associate Member of the Royal Academy, in the present exhibition of which he shews three pictures, and Mrs. Stanhope Forbes one. A word as to Newlyn itself. At first the artists found very rough quarters. "Here is "a mite of a cottage clinging close to the ground, as the Cornish "cottage loves to cling. Under its beetling roof of thatch it "looks almost too tiny to harbour the broad-chested yellow "bearded fisherman whose home it is. Your eyes wander from "one to another of its quaint details and lo, in the midst of the "weatherbeaten thatch there is a large glass skylight. It is in "these primitive quarters that an artist has found a nook for his "studio." While another writer says: "A Newlyn artist in "those days was put to an awkward shift...at best the thing "was a picnic, a hazard, and a man had to labour, so to speak, "with his work on his knees. To say that Mr. Stanhope Forbes "buckled to his enterprise amid such untoward surroundings "says much not only for his enterprise, but for his hardihood." Now, however, all this has changed. At the instance of Mr. A. Bateman, an enthusiastic amateur, the upland known as "California" carries quite a number of well built studios.

But I must not linger longer over the fascinating subject of Newlyn. A word for the St. Ives School, which was founded

later by half a dozen artists, nearly all of whom have obtained considerable repute. I can only record their names, Adrian Stokes, Louis Grier, Julius Olsson, Mr. Green, Arnesby Brown and J. Noble Barlow. I feel that I must now bring this address to a close, but before doing so, I will, as I promised, give a list of deceased Cornish-born artists of some repute, so far as I have been able to ascertain their names.

CORNISH-BORN ARTISTS (DECEASED).

- BONE, HENRY (1755-1834), born at Truro, apprenticed to William Cookworthy the founder of the Plymouth porcelain works. The china decoration by him is of high merit, and is said to be marked with the figure "I" in addition the factory mark. On the failure of his master he came to London and found employment in enamelling. In 1780 he exhibited at the Royal Academy a large enamel portrait of his wife. In 1800 he was appointed enamel painter to the Prince of Wales and afterwards held the same position to George III, George IV and William IV. He has been well called the "prince of enamellers."
- BONE, HENRY PIERCE (1779-1855), son of Henry Bone, was enamel painter to Queen Adelaide, and Queen Victoria.
- BONE, ROBERT TREWICK (1790-1840), son of Henry Bone, confined himself almost exclusively to sacred, classic and domestic subjects. His works, though generally small, are tasteful and sparkling.
- BURNARD, NEVILL NORTHEY (1818-78), born at Altarnon, near Launceston. At the age of 16 he carved in slate the group of the Laocoon which was exhibited by the Royal Cornwall Polytechnic Society at Falmouth. This was executed from a woodcut in the Penny Magazine and was considered so remarkable a production that the society awarded Burnard their first silver medal. Sir Chas. Lemon, Bart., M.P., introduced the young sculptor to Chantrey, and Her late Majesty Queen Victoria gave him a commission for a bust of the young Duke of Cornwall, now King Edward VII, which is placed in the Polytechnic Hall, Falmouth. The statue of Richard Lander, the African explorer, erected at Truro was also executed by Burnard. I may perhaps

mention that he executed a bust of my father-in-law, Mr. John Benjamin Smith, which is in my possession.

CONDY or CUNDY, NICHOLAS (1793-1857), born at Torpoint.

Condy was originally a soldier and served in the Peninsula. He retired on half pay in 1818 and devoted himself to art. He chiefly produced small water colours on tinted paper, about 8 x 5, which he sold at prices ranging from 15/- to a guinea.

CONDY, NICHOLAS MATTHEWS (1818-51), son of the above, was a professor of painting at Exeter, exhibited sea pieces at the Royal Academy which gave hopes of a distinguished career. He died prematurely when aged only 33.

COOK, SAMUEL (1806-59), born at Camelford.

He was apprenticed at the age of nine and had to feed a machine, called a "scribbler" with wool. During the intervals of his labour he amused himself by drawing with chalk upon the factory floor, to the annoyance of his employers, one of whom told him "he would never be fit for anything but a limner." He worked hard and in 1830 sent some of his work to the New Society of Painters in Water Colours, which obtained him admission into that body.

CRISTALL, JOSHUA (1767-1847), born at Camborne.

He began life with a china dealer and then became a china painter in a Burslem pottery, living in great hardship. It is said that he seriously injured his health by trying to live for a year on nothing else but potatoes and water. At the foundation of the Society of Painters in Water Colours, he first publicly exhibited his works, and in 1821 was elected its first president, an office he held for 11 years. He is regarded as one of the founders of the English school of water colours.

CUNDY, THOMAS, the elder (1765-1825), born at St. Dennis, near St. Austell. Went to London when 21 years of age and gained a great reputation as an architect. Among the important buildings either built or altered by him are Hawarden Castle, Zion House, Northumberland House, Wytham, and Burton Constable.

- CUNDY, THOMAS, the younger (1790-1867), son of the above, also a noted architect and associated with his father in many of his works.
- CUNDY, JAMES (1792-1826), second son of Thomas Cundy the elder, was a sculptor of great promise. He exhibited "Eve supplicating Adam" in 1818, and met with an accident in 1826, from which he died.
- FOX, CHARLES (1749-1809), born at Falmouth. He began life as a bookseller, but later turned his attention to art, practising both landscape and portraiture. He was a celebrated Eastern scholar and published translations from the Persian. Proofs of his humour and accurate observations of character are to be found in his Cornish dialogues printed by Polwhele and others.
- LANE, JOHN BRYANT (1788-1868), born in Cornwall. Exhibited some pretentious works at the Royal Academy from 1808 to 1813, and then went to Rome, where, during the next fifteen years, he was chiefly employed on an ambitious picture "The Vision of Joseph," which proved a failure.
- OPIE, JOHN, R.A. (1761-1807), born at St. Agnes, of whom I shall speak presently.
- OPIE, or OPPEY, Master, born in Cornwall, in no way connected with the R. A. In the catalogue of the Incorporated Society of Artists, 1780, he and his works are thus described, "Master Oppey, Penryn, A Boy's Head, an instance of genius not having seen a picture." This head is said to have been expressive and well coloured, and to have attracted attention on its merits. The painter died young in 1785.
- PHILP, JAMES GEORGE (1816-1885), born at Falmouth. First exhibited at the Royal Academy in 1846. Chiefly painted in water colours.
- PIDDING, HENRY JAMES (1797-1864) was the son of a Cornish lottery-office keeper. He attained some note by his paintings of humorous subjects from domestic life. Several of his pictures were engraved, some by his own hand in mezzotint. His best known works are the "Gaming Room at Homburg," and "Greenwich pensioners."

RULE, WILLIAM HARRIS (1802-90), born at Penryn. For some years made a living by portrait painting and probably would have obtained a good position if he had pursued it as an avocation. His bent, however, was philology and he is said to have been master of ten languages. He became a Wesleyan and published many works on religious and historical subjects.

I do not doubt that this list is exceedingly imperfect, but such as it is I thought it might be of permanent interest, as I believe such record does not exist anywhere else,

I must especially notice the first on my list, Henry Bone, who was born here in Truro in 1755, and who achieved very great distinction as an enameller. It is perhaps worth recording that a catalogue of his works (including those of his son), amounting in all to 1063 in number, was compiled by Mr. J. J. Rogers, and will be found in the Journal of the Royal Institution of Cornwall for 1880. Two other Cornish artists who achieved remarkable distinction I must also mention—Joshua Cristall (born in 1767 in Camborne) who is universally recognised and remembered as one of the “creators” of what has now for a long period been one of the peculiar glories of England, I mean *our water colour school*; and John Opie (born in 1761 at St. Agnes, of the poorest parents) who shewed such extraordinary ability that he attracted the notice of Dr. Wolcot (better known as “Peter Pindar”) who, when he removed to London in 1781, brought the young untaught artist with him, started him in a studio and advertised him as “The Cornish Wonder.” It is said everybody flocked to him, even Sir Joshua Reynolds being neglected. When this society craze had passed away, young Opie found himself possessed of some money and he married prudently. He then, unspoiled with his great success, set himself to patient study of the art of painting, and afterwards painted several important historical pictures. He was elected a full member of the Royal Academy and he, who was at twenty years of age the “*untaught boy*,” was eventually chosen to succeed Fuseli as professor of painting at the Royal Academy itself. It is said he only lived to deliver four lectures, dying somewhat suddenly in 1807 at the early age of 46. There is no

doubt that Opie (whose proper surname was Oppy) possessed real genius, and remains (so far as I can ascertain) the greatest artist born in our county.

I have now only to express my regret that I have not been able more perfectly to place before you the scenery of our county, the artists who have portrayed it and the native-born artists who have adorned it.

ANNUAL EXCURSION, 1905.

The annual excursion took place on Thursday, 27th July, 1905, the party starting from Penzance railway station at 11.15 a.m. In spite of showers the weather was on the whole pleasant and bright.

The company included the Revs. S. Rundle (Godolphin), W. R. Daine (Stithians), and H. H. Mills (Treslothan), Professor O. V. Muller (Newquay), Capt J. S. Henderson and Miss F. L. Henderson, Mr. J. D. Enys, Mr. B. Iazard, Mr. Thurstan C. Peter and the Misses Peter (Redruth), Miss O. Webb (Truro), Mr. Horton Bolitho (Penmere), Mr. W. N. Carne (Rosemudy), Mr. W. Bullen and Miss Bullen (Truro), Mr. T. L. Dorrington (Truro) and Miss Hawley (Bath), Mr. J. R. Collins (Bodmin), Mr. J. H. Collins and the Misses H. and G. Collins (Crimmis), Mr. Rupert Vallentin and Mrs. Vallentin (St. Ives), Mr. H. James (Truro), Mr. F. H. Davey (Ponsanooth) Mr. H. H. Share and Miss Share (Truro), Mr. and Mrs. A. Blenkinsop (Truro), Mr. E. M. Milford (Redruth), Mr. S. M. Abbott (Redruth), Mr. A. P. Jenkin (Redruth), Mr. and Mrs. S. Jones and Miss Jones (Redruth), Mr. W. J. Oates, Mr. J. Knuckey (Truro), Mr. J. W. Towan (Carharrack), Mr. F. T. Dowsing (Truro), Mrs. Chellew Woolcock, Miss Hedley, Miss W. K. M. Coode, Mrs. S. H. F. Roë, Miss Jacks, Major Parkyn, F.G.S. (hon. secretary), and Mr. Geo. Penrose (Truro). Letters of apology for absence from the excursion were received from Sir Edwin Durning-Lawrence, Bart., M.P. (president), the Revs. W. Iago, T. Taylor, and D. G. Whitley, the Mayor of Truro (Mr. W. F. Clarke), Mr. R. Faull. The following joined the party at dinner:—The Rev. C. F. Rogers (Penzance), the Mayor of Penzance (Mr. J. H. Bennetts), Dr. Hugh Montgomerie, Mr. A. K. Barnett. Letters of apology for absence from the dinner were received from the Rev. W. B. Tremenheere, the Hon. Piers St. Aubyn, Col. Bolitho, Mr. T. R. Bolitho, and Mr. T. B. Bolitho.

Bleu-Bridge was the first halt. The stone inscribed in debased latin capitals of about the 7th century ‘*Quenatavus Icdinui filius*’ was inspected but no new light thrown on its

history. (See on this stone Journal R.I.C., vol. 8, p. 366, Archæo. Cambrensis., 5th S., vol. 12, p. 50). The word *bleu* means in Cornish "parish," and is believed to be the same as occurs in this place-name.

Over beautiful country the cars next carried the party to the interesting group of dwellings at *Chysauster*. Various ideas were expressed as to their age, some regarding them as prehistoric and others arguing that the style of building was modern and that the weathering of the stones confirmed their late date. In his "Historical Sketch of the Tin Trade in Cornwall" (p. 36), W. C. Borlase says that Romano-British remains were found here, but these remains were perhaps meant. If any such objects as pottery or coins were found they have apparently been lost. The settlement is figured in Lukis's "Prehistoric Stone Monuments of the British Isles." Lunch was taken at Treryn, after which some visited the Gurnard's Head to view a hut circle found by Mr. J. B. Cornish, who here joined the party, while others went to Bosphorthennis to examine the beehive hut.

Thence past Carngalva, and Bosigran (where is a cliff castle), obtaining views of Zennor, Pendeen and Morvah churches, which, however, there was not time to visit, to *Mên Scryfa* ("the inscribed stone") and *Mên-an-tol*. Professor Hübner classifies the former, on which are cut the words "Riolabran Cunoval fil," with many similar monuments believed to be Christian. Its date is regarded as 6th century. The *mên-an-tol* (holed stone) stands between two others unpierced, and perhaps formed part of a larger erection. Considerable discussion took place as to its original purpose, and hopes were expressed that the researches of Sir Norman Lockyer would in time help to the better understanding of this and other stone erections in the county. Nowadays it is regarded as a means of magical cure of rickets in children. Within sight was *Ding Dong* mine, believed, from the nature of its workings, to be one of the oldest in Cornwall.

The next object visited was *Lanyon Quoit*, a fine dolmen. Upset in 1815, it was restored in 1824, when, unfortunately, its uprights were somewhat cut down. In Dr. Borlase's day a man could ride under it. The supports are columnar, and do not, as in most Cornish examples, enclose a chamber.

Thence to Madron Church. In 1203 there was a dispute concerning the advowson between King John and the Knights Hospitallers, which was settled in favour of the latter. In an extent made in 1338 (and published by the Camden Society), the rectory is described as appropriated to the preceptory of the Hospitallers at Trebigh, in St. Ive. The church (well restored in 1887) is a 14th century building, much altered in the 15th and 16th centuries. Its high altar was consecrated in 1336. There is some old glass, stated in *Trans. Penzance Nat. His. and Antiq. Soc.* (vol. 1, p. 312), to be by Holbein, but without reference to evidence. One of the bench-ends bears the arms of Henry VIII. There are here nine alabaster figures of angels, probably part of a medieval reredos, a Norman font, and other objects of interest, old and recent. In the yard is the well-known epitaph of Alex. Daniell (died 1668):

“Belgia me Birth, Britain me Breeding gave, Cornwall a Wife, ten children and a grave.”

His son George, who established a free school here, is buried near by.

Here ended a pleasant excursion, though many objects of interest had, through lack of time, been passed by unnoticed. There were no formal papers read during the day.

Dinner was enjoyed at the Railway Hotel at Penzance, where the party were the guests of the ever generous president, Sir E. Durning-Lawrence, whose enforced absence was much regretted. The chair was taken by Mr. J. D. Enys, who gave the usual loyal toasts, after which Mr. J. H. Collins proposed the health of the president in a witty and genial speech that put everybody on the best of terms with himself and everybody else. The Rev. S. Rundle proposed the health of the chairman and remarked that however much his hearers might differ on such questions as the age of Chysauster or the object of the *mên-an-tol* they were certainly united in regarding Mr. Enys with regard, esteem and affection. Mr. Enys suitably replied. Remarks were also made by Mr. J. H. Bennetts (Mayor of Penzance), the Rev. Charles F. Rogers, Dr. Hugh Montgomery, Major Parkyn, Messrs. A. K. Barnett, Thurstan C. Peter, and John R. Collins.

During the evening the following telegrams passed:—

To president—"Pleasant greetings from the excursionists now dining at Railway Hotel, Penzance. Great regret at the absence of Lady Lawrence and yourself." President's reply—"Many thanks; give all my heartiest good wishes" A telegram was also sent to the Rev. W. Iago, hon. co-sec, regretting his absence.

Royal Institution of Cornwall.

ANNUAL MEETING, 1905.

The Annual Meeting of the Institution was held at the Museum Buildings, Truro, on Wednesday the 13th December, 1905. The retiring president, Sir Edwin Durning-Lawrence, Bart., M.P., occupied the chair and there were also present Mr. Howard Fox, F.G.S. (president-elect), the Mayor of Truro (Mr. W. F. Clarke), Chancellor Worledge, Archdeacon Bourke, Revs. St. A. H. Molesworth-St.Aubyn, W. R. Daine, H. Edwardes, W. E. Graves, S. H. Farwell Roe, and D. G. Whitley, Dr. J. Clark, Dr. C. C. Vigurs, Messrs. W. Barratt, H. Bolitho, F. J. Bowles, W. N. Carne, J. R. Collins, J. H. Collins, F.G.S., F. A. Cozens, J. C. Daubuz, F. H. Davey, F.L.S., T. L. Dorrington, J. D. Enys, F.G.S., W. G. N. Earthy, D. E. Graves, G. E. Graves, H. James, P. Jennings, S. Jones, E. Kitto, F.R.Met.S., J. Morrish, A. P. Nix, W. J. Oates, T. C. Peter, H. G. Pool, L. A. M. Riley, W. A. Rollason, H. H. Share, J. Collette Thomas, W. Tresidder, J. W. Towan, and Rupert Vallentin, F.L.S., Lady Durning-Lawrence, Mesdames Blenkinsop, Buck, Clark, Cornish, Chellew-Woolcock, Fox, Graves, Iago, Jones, Kitto, Leverton, Molesworth-St.Aubyn, Paul, Rollason, Rose, Vallentin, Wallis; the Misses Barclay, Burrell, H. Collins, Cornish, J. Davey, A. M. Davey, M. Gregg, James, James, L. Jones, J. Leverton, Lidgley, L. Paull, E. Parkyn, Sansom, Share, Thomas-Peter, and Uren. The Rev. W. Iago, and Major Parkyn, F.G.S. (hon. secretaries), and Mr. George Penrose (curator).

The minutes of the last meeting (23rd May, 1905) were read by Major Parkyn and confirmed.

The chairman announced that letters of apology for absence from the meeting had been received from the Bishop of Truro, Rev. Sir Vyell Vyvyan, Bart., Rev. Canon S. R. Flint, Rev. S. Rundle, Rev. H. H. Mills, Dr. W. Hammond, Capt. Rogers, R.A., Messrs. R. Fox, James Osborne, C E., A. P. Jenkin, and J. M. Coom.

The rev. W. Iago presented the 87th annual report of the Council:—

87TH ANNUAL REPORT.

In presenting their 87th annual report it affords the Council very great pleasure to be able to state that the position of the Institution is stronger to-day than at any period of its history. During the past two or three years the museum has received such numerous and valuable additions that it has now become more than ever one of the important features of the county. The funds of the Institution are very satisfactory and will soon be greatly increased by a legacy from one of our late members. Its outlook in the future is a bright one. The roll of members has been well maintained and the Institution is fortunate in having many gentlemen associated with it whose interest in its welfare is very great.

The Council much regret that during the past year the following members have been lost by death:—

The late Mr. Jonathon Rashleigh, of Menabilly, was a Cornish magistrate whose influential position in the county was widely recognized. He was one of our past-presidents and had taken much interest in the welfare of our society during many years. Towards the close of his life he was loth to see the great Rashleigh collection of minerals, that he had inherited, pass out of the county; and he was therefore willing to allow of its being acquired for our museum on special terms, when more might have been realized by a different disposal. As already recorded the matter was, owing to the kindness of our friends, successfully carried through.

The demise of Col. Arthur Tremayne, of Carlew, who was for many years one of our trustees and subscribers, is much deplored by the Council. His high appointments in the county, distinguished military career, and private influence for good, are too well known in Cornwall to need recounting at length in this report. His heroism in the Balaclava charge and on other occasions, his efforts for the welfare of Truro diocese and of the county at large, are familiar to us all.

The death of the Rev. Canon Saltren Rogers has likewise been felt as involving the loss of a kind friend, who, as one of our members for many years, contributed to our proceedings.

Mr. Thomas Varker Keam, deceased, was an old and valued member of our Institution. A native of Truro, he spent most of his life in America where he filled important positions. One of the great canõns in Arizona is named after him "Keam Canõn." He held a commission in the American army and was employed by the State's Government in their negotiations with native tribes over whom it appears he exercised an influence that was unique. His interest in the Royal Institution of Cornwall was great, and many gifts of value were presented by him to our museum, including a fine series of silver ornaments made by the Navajo Indians. Mr. Keam happened to be staying in Truro when the Rashleigh minerals were arriving, and with great delight he attended almost daily at the museum while they were being unpacked. Useful suggestions made by him with regard to the collections in the museum were acted upon whenever circumstances permitted. He returned afterwards to America, and almost as soon as he reached New York he made his will, bequeathing to this Institution a legacy which will probably be found worth more than £5,000. His health subsequently began to fail and in a few months he was back again in Truro. He died shortly after our last November meeting. He is regretted in this city by his numerous friends and others besides our members. He readily assisted charitable undertakings, and cases of distress.

By the decease of Sir Warwick C. Morshead, 3rd baronet, another supporter of our Institution has been removed, and the baronetcy has been allowed to lapse.

The presence of the late Miss Tomm, of Truro, will be much missed. She constantly attended our spring and autumn meetings and took much interest in them.

The death of Mr. John Barrett, of Truro, who possessed much local knowledge and experience, has deprived the Council of the valuable assistance he afforded in matters requiring consultation.

Sincere regret is also felt at the death of the following members :—

The Rev. T. S. Stephens, of St. Erme; Mr. Edward Sharp, M.R.C.S., of Truro; and Mr. W. J. Clyma. The last named, as a

Truro resident, took much pleasure in attending the society's gatherings. From his tastes and special opportunities for observation, he possessed much knowledge of Cornwall and its literature.

The additions to the museum have again been numerous and of a valuable nature. Special mention should be made of the following:—

From one of our past-presidents, Mr. J. C. Williams, we have received six handsome show cases, equivalent to a gift of about £200. They are of the best mahogany, french polished and glazed with plate glass and were made specially for the mineral collection from designs prepared by our curator, Mr. Geo. Penrose. Similar cases were presented last year by Mr. J. D. Enys and Sir J. Langdon Bonython, and it is hoped that during the coming year it will be possible to obtain the six others required to complete the mineral collection.

Mr. H. W. Seton-Karr has presented a selected series of ancient stone implements from India, Egypt and France. Many of them are of beautiful workmanship and they will be very useful for comparison with those found in our own country.

The Earl of Mount Edgcumbe has presented the fragments of a small cinerary urn found at Treworrick in St. Ewe. It will be remembered that last year his lordship presented one from the same place.

Several valuable pictures have been added to the art department.

Mr. Frederick Smallfield, A.R.W.S., has just sent, through Sir Edwin and Lady Durning-Lawrence, a very fine oil painting by himself "The Ringers of Launcells Tower." The Rev. R. S. Hawker's poem suggested the subject to the artist. Curious to relate the young men who were ringers at Launcells at the time of the accession of George III all lived to ring at his jubilee, fifty years later. The picture depicts the ringers as old men ringing in the jubilee of George III. Mr Smallfield is an artist of considerable merit and his painting will form one of the principal features of our gallery. At the close of the meeting to-day Sir Edwin Durning-Lawrence will formally make the presentation on behalf of Mr. Smallfield. The Institution is greatly indebted to Sir Edwin for securing the picture and for

bearing the cost of restoring the frame, glazing with plate glass and carriage and insurance from London to Truro.

William Varley's original sketch of St. Mary's church, Truro, in 1806 is also an important addition. It was purchased at the sale of the late Mr. W. J. Clyma's effects for Sir Edwin Durning-Lawrence who has since presented it to the Institution.

Mr. Alderman Dorrington has presented three engraved copper plates that were also amongst Mr. Clyma's effects. One gives the exterior view of St. Mary's church, engraved by F. C. Lewis, from a sketch by Varley referred to above. Another is from a sketch by the same artist of the interior of the church and the third a view of Truro from Kenwyn also by Varley in 1806, showing in the distance the old cavalry barracks then existing. The plates are in a perfect state of preservation and at the request of several members of the Institution a number of impressions have been made of the view of Truro from Kenwyn. They are printed on India paper and mounted on plate paper and any member desirous of having a copy may purchase one for a small charge. If there is any demand for the views of St. Mary's church impressions from those plates will be made also.

The late Mr. T. H. Hodge bequeathed a portrait of his grandfather, Mr. Blee, of Truro, said to have been painted by John Opie.

Several works have been presented to the library notably by Mr. John D. Enys, and Sir Robert Harvey has given a copy of the new edition in two volumes of Fairbairn's Book of Crests.

The number of visitors to the museum continues to steadily increase. During the greater portion of the month of December last the building was closed for the purpose of painting and renovating some of the rooms. Notwithstanding this, however, the total number exceeds that of previous years.

Admitted free	4,478
Members and friends	1,059
Admitted by payment	340

5,877

Considerable work has been done in the museum. To the mineral department it has been possible to devote special attention in consequence of the better accommodation afforded by the new cases so generously presented by Mr. J. C. Williams. The method of classification adopted is the latest and the one considered the best, and the minerals are displayed in an attractive manner which compares very favourably with any provincial museum in the kingdom.

A large room on the ground floor has been prepared for exhibition purposes and many of our valuable objects of art have been collected together and arranged there. The greater portion of the collection of local antiquities has also been transferred to this room and placed in temporary cases, to serve as examples of prehistoric art. An effort will be made during the coming year to obtain new cases for this room.

A great deal of work has also been done in connection with the care and preservation of the various collections both generally and in detail.

The curator, Mr. George Penrose, is specially commended for his admirable work in the museum and in other departments of duty. He has bestowed an immense amount of labour and scientific attention upon the up-to-date classification and arrangement of the enormous number of precious objects recently acquired, as well as in transferring and transforming the old collections into a far better state and arrangement. The adaptation of new space, the procuring of many costly gifts, including cases constructed in accordance with his own designs, and other important advantages have been secured and are being still further advanced, to a great extent through his laudable exertions.

Reference has been made to the Keam legacy. The estate has not yet been wound up and consequently the Council cannot give any exact details as to the amount to be received by the Institution. The legacy, however, when received and properly invested will considerably increase the income of the Institution and will be of great help in the maintenance of a larger building whenever funds permit of an extension being made. Such extension is much needed in order that the Institution may

properly carry on its useful work and the Council hope that it will be soon possible to make a start in this direction. With this object in view it was found that if the Council wished ultimately to possess suitable property adjoining the Institution it was necessary, in order to avoid trouble and additional cost in the future, to secure it almost immediately and the Council have therefore purchased such property and they propose, until funds permit of a suitable building being erected, to retain the present shops as an investment of part of the Kean trust moneys. The site will afford excellent lighting and plenty of accommodation which is essential to a museum and art gallery and it will admit of the principal entrance being from the High Cross, which will bring the building well under the observation of the public. Its present approach is much too secluded.

The Journal (No. 51) published in August contained several valuable papers. To Sir Edwin Durning-Lawrence the Institution is indebted for bearing the cost of reprinting, as an appendix to his address, "Steam in relation to Cornwall," Thomas Savery's book "The Miner's Friend." This book, published in 1702, is now exceedingly rare and whenever an occasional copy is met with it always commands a high price. Mr. J. D. Enys kindly provided the necessary number of copies of the plate "*Fumaria occidentalis*, Pugsley" to illustrate Mr. F. H. Davey's Botanical Report for 1904, and Mr. Thurstan Peter also provided some of the process blocks necessary to illustrate his paper on the "Church of St. Ives."

The excursion this year was very successful and a large number of members and friends took part. The district selected was the neighbourhood of Zennor and Penzance and a long day was spent in examining as many of the antiquities as time would permit. On reaching Penzance in the evening the party proceeded to one of the hotels where they were entertained by the president at dinner. A detailed report of the excursion will be given in the Journal.

This being the year for the presentation of the Henwood Gold Medal the Council met a short time ago in accordance with the will of the donor and after carefully considering the papers published in the Journal during the past three years were

unanimous in awarding the medal to Mr. Fred. Hamilton Davey, F.L.S., for his researches in connection with the botany of Cornwall. The medal will be presented to Mr. Davey during the course of the present meeting.

The Council and other members of the Royal Institution of Cornwall here desire to place on record their high appreciation of the very valuable services that are continually being rendered to the society by Major Parkyn, F.G.S., who, as honorary secretary resident in Truro, is enabled to exercise constant supervision over the affairs and possessions of the Institute.

In co-operation with the president and others of the Council, all matters of management and local direction are most ably carried into effect, year by year, by Major Parkyn, in his zealous care for the best interests of all concerned; and it is recognized that he deserves the highest honor they can bestow upon him.

From his long experience and thorough knowledge of all that the society aims at, and from the success of his arrangements in promoting the society's investigations in various parts of Cornwall, it has long been felt that he possesses in an eminent degree special fitness for the office of president.

This the Council unanimously endeavoured to prevail upon him recently to accept but he has deemed it right to decline the honor, considering that advancing age might render it advisable for him not to undertake the duties. He will continue to hold his present position and the Council recommend that, in addition, he be appointed a vice-president. He would eventually have been called upon to accept this honor, had he served two years as president. Long may the benefit of his services, in his two-fold capacity, be continued to the Institution.

All connected with the Institution (collectively and individually) regret the illness of the Lord Bishop of Truro, one of its most highly esteemed members. All hope for his lordship's speedy recovery. They feel great satisfaction at the choice of a suffragan bishop of St. Germans having fallen upon Archdeacon Cornish who has been for many years a very useful member of their Council.

Sir Edwin Durning-Lawrence's term of office as president expires to-day and the Council desire to place on record their

great indebtedness to him for his many kindnesses to the Institution during the past two years. Sir Edwin has come specially from London to attend our meetings. He has delivered addresses which have been appropriate and full of interest and has presented valuable gifts to the museum and contributed to the Institution's funds. To Lady Durning-Lawrence the Institution is also indebted for gifts to the museum and assistance in many other ways.

In nominating Mr. Howard Fox, F.G.S., to succeed Sir Edwin Durning-Lawrence, Bart., M.P., as president, the Council feel that the selection will meet with the full approval of all the members. Mr. Fox is a member of an old and distinguished Cornish family and has devoted the greater part of his life to a variety of interesting and useful pursuits connected with the literary, scientific and general development of Cornwall. He has long been a valued member of our Council.

The Council recommend that the following gentlemen be appointed to the respective offices for the ensuing year:—

Trustees :

The Rt. Hon. VISCOUNT CLIFDEN.	|	Mr. J. C. WILLIAMS.
Mr. F. G. ENYS.	|	Sir ROBERT HARVEY.

President :

Mr. HOWARD FOX, F.G.S.

Vice-Presidents :

Mr. JOHN D. ENYS, F.G.S.	|	Sir J. LANGDON BONYTHON.
Rev. S. BARING-GOULD, M.A.	|	Major PARKYN, F.G.S.
Sir EDWIN DURNING-LAWRENCE, Bart., M.P.	|	Ven. ARCHDEACON of CORNWALL.

Treasurer :

Mr. A. P. NIX.

Secretaries :

Major PARKYN, F.G.S., and Rev. W. IAGO, B.A.

Other Members of the Council :

Mr. HAMILTON JAMES.	|	Mr. JAMES OSBORNE, F.G.S.
Rev. D. G. WHITLEY.	|	Prof. J. CLARK, D.Sc., M.A.
Chancellor PAUL, M.A.	|	Rev. H. H. MILLS, M.A.
Mr. THURSTAN C. PETER.	|	Mr. HORTON BOLITHO.
Rev. S. RUNDLE, M.A.	|	Mr. RUPERT VALLENTIN, F.L.S.

Joint Editors of the Journal :

Mr. THURSTAN C. PETER and Major PARKYN, F.G.S.

The adoption of the report was proposed by the Rev. St. A. H. Molesworth-St. Aubyn, seconded by Mr. J. H. Collins, F.G.S., the latter remarking that he did not think he had ever heard

such a satisfactory report before.—The resolution was carried with acclamation.

Sir Edwin Durning-Lawrence in vacating the chair in favour of the new president said: I am exceedingly glad that I am able to be with you on the present occasion when it is my duty to hand over to my successor the office in which you placed me two years ago. I have enjoyed very much my tenure of the position of president of the Royal Institution of Cornwall and I feel much satisfaction that during my presidency the Institution has entered upon what seems likely to prove a greatly extended sphere of usefulness. My only regret is that I have been prevented from presiding here so often as I could have wished, but I can assure you that, even though I was unable to be with you, I have always had at heart the best interests of this great Institution. Ladies and gentlemen, may I be permitted to say how glad I feel that the office is now to pass to a gentleman so well known and so highly esteemed as our friend, Mr. Howard Fox, and in leaving the chair will you allow me to repeat my warm thanks to you for the honor you did me by placing me in the distinguished position which I am so proud to have filled, and to express my most earnest wishes for the continued success of this Institution, the welfare of which I can assure you I shall ever continue to do my best to promote.

On taking the chair, Mr. Fox said:—

Ladies and Gentlemen: You must kindly allow me a few words of personal explanation. I came here on the 15th of last month expressly to vote for Major Parkyn as your president. The Council had repeatedly pressed him to accept the office but they found that he really and honestly preferred to continue to carry out the duties of your local honorary secretary, without the addition of those falling on the president. They then elected me. I was taken so much by surprise that I did not even thank them for the honour. For this breach of courtesy I tender them my apologies; but if they deal in shocks they must be prepared for surprises. I naturally felt that some well-known Cornishman of greater ability and more leisure than myself should have been elected, and I was not, and am not, without an uncomfortable sense of the appropriateness in my case of Pope's celebrated

words about rushing in "where angels fear to tread." You may well ask "Why then did you accept the post?" I will tell you why.

In the first place, I knew that I should have the advantage of sitting next to Major Parkyn and of being guided by his experience, so that in all official matters he would hold the tiller while I should be simply the figure head. The work and progress of this Institution, moreover, do not depend on the president. There are seated around this table at the Council meetings some of the most trustworthy living authorities on the literature, antiquities and natural history of Cornwall. They are always eager to promote the interests of this Institution.

In the second place, if a high appreciation of the contents of your journal with its artistic illustrations and of your museum be one of the qualifications of a president, I may say, without arrogance, that I do not think anyone can excel me in this one respect.

In the third place, I was influenced by the hope that during my two years of office I might be able to promote the commencement, if not to see the completion, of a general index of your journal from the birth of your society in 1818.

At the end of your volume for 1854 the papers that were read during the previous 16 years were arranged in alphabetical order according to their titles, but this hardly deserved the name of an index. No further attempt at one appears until at your Spring Meeting, May 23rd, 1876, your president, Mr. Jonathan Rashleigh, called the attention of your Council to this matter and said "great complaints are made of the want of an index." Since that time an index has appeared in each of your volumes, and your editors have made them so increasingly efficient, that for the past 20 years they may be taken, for the most part, as models of what indexes should be. But something more than this is wanted. Lord Mount Edgcumbe in his address in 1882 appealed for such a "*Catalogue raisonné*" as would enable any one to find what he wanted without searching through the tables of contents or index of each separate volume. Such a catalogue, to use his own words, "might in itself be a most interesting volume and would add greatly to the value of all the previous

publications." Mr. Thurstan Peter in his stimulating paper read at the Spring Meeting of 1901 suggested the appointment of an "Index Committee." If no competent volunteer offers to undertake this general index I think it should be made worth the while of some lady or gentleman of literary ability and sufficient leisure to take it in hand. I trust that in cases of doubt, as to whether, or how, certain references should be included in such index that your presentable editors would do you the service of acting as a court of appeal for final decision. We do not accuse your earlier editors of neglect. An index though often wanted used not to be considered a *sine qua non*. Dr. Johnson in writing to Richardson, March 9th, 1750-1, said "I wish you would add an *index rerum* that when the reader recollects any incident he may easily find it." How many thousands have echoed this wish when reading works of great interest. Carlyle complained of the intolerable waste of time involved in verifying references in the un-indexed works he consulted. He led the way in the needed reformation by providing his own books with such as are a delightful study to read. In his "Frederick the Great" he speaks of "Books which want all things, even an index."

We ask the Council to kindly consider how they can help us in this matter, as well as in a catalogue of the library books, manuscripts and records, belonging to this Institution which a former president happily styled "the centre and mainspring of all the historical literature of the county."

The primary object of this meeting this afternoon was to listen to the report of the Council which you have just heard. The presidential address is not due until next May so I will simply in conclusion ask you to be lenient to my short-comings, and to remember the request nailed up at the entrance of a saloon in the far west of North America—"Don't shoot the pianist, he is doing his best."

PRESENTATION OF THE SIXTH HENWOOD GOLD
MEDAL.

The president (Mr. Howard Fox) said, It is my pleasant duty, Mr. Davey, to present to you the Henwood medal, unanimously awarded to you by the Council for your botanical contributions to the journal during the past three years.

It is particularly gratifying to me to be the medium of this presentation.

I have watched your career for many years, with much interest, always with admiration, not unmingled with some envy of the enthusiasm and thoroughness with which you have been able to carry out your observations and researches in various branches of natural history.

Your report for 1904 announced the addition of 12 new species to the Flora of Cornwall, 11 of which rank as natives, besides several sub-species and varieties. This discovery is in itself a splendid reward to you for your time and trouble in editing the new List of Cornish plants. Whenever the volume is published your fellow Cornishmen and women will have the satisfaction of knowing that no pains have been spared to make it as complete as possible.

To have added to the British Flora within twelve months three new species of Fumitory from this county, of which you personally discovered one, is indeed a triumph.

The Council have had the greatest pleasure in awarding you this medal and they congratulate you heartily on your well-earned honour.

Mr. Enys congratulated Mr. Davey, and Dr. Clark remarked that Mr. Davey possessed what many scientific men did not, great earnestness and enthusiasm, and the gift of accuracy, which was of the very highest importance. He was also cautious; had an immense capacity for detail, and wonderful power in handling large masses of facts. He hoped the presentation of that medal was but the earnest of honor still in store for him (applause).

Mr. Davey said they would not need a verbal expression from him that he looked upon that as one of the proudest days of his life. That the Council of the Royal Institution of Cornwall had seen sufficient merit in the work which he had accomplished in connection with one of the richest sections of the British Flora to honor it with the Henwood gold medal, was to him a matter for surprise and gratitude. He could not promise that, as a result of the award, he should apply himself with greater zeal to his work, for he believed that to be impossible; but this he would say—that whatever close and constant application could do to bring to a successful issue the big undertaking on which he had embarked, would be done, and, when completed, he hoped to further justify the high confidence they were that day placing in him, by numbering him with those men, eminent in the ranks of science and literature, on whom the Henwood medal had already been conferred. Much of what he had been able to contribute to our knowledge of the Cornish flora would have been impossible had not a number of willing workers come to his assistance. To mention them all by name would occupy too much of the time of the meeting, but he could not sit down without telling them that from first to last Mr. J. D. Enys had abounded in kind acts. He had spared neither time nor money to help forward the work, and on not a few occasions had removed what seemed insuperable difficulties.

Mr. Rupert Vallentin, F.L.S., presented a preliminary report on the Fauna of St. Ives Bay and handed round specimens which he had taken and which he afterwards presented to the museum.

Mr. Thurstan C. Peter gave some particulars of the mural paintings in St. Keverne Church, of which he produced a sketch by Mr. W. A. Rollason. (See the note to the reproduction of this sketch below.)

The Rev. D. G. Whitley referred to interesting geological discoveries in the north of Siberia by Baron Toll, which he asked all interested in the subject to follow up as being most remarkable.

Dr. J. Clark read "Notes on Cornish Birds."

Mr. F. H. Davey, F.L.S., presented his Botanical Report for 1905, and exhibited specimens of new plants that had been found in the county.

The Rev H. Edwardes said an effort was being made to preserve St. Piran's Oratory, on Perran sand hills, and he moved that Mr. J. D. Enys and Mr. T. C. Peter be co-trustees with those to be appointed by the Diocesan Conference to take the matter in hand, Mr. Coulter Hancock, the lord of the manor, having promised to hand over the property to them. Mr. E. Sedding would have charge of the renovation.

Mr. Alderman T. L. Dorrington seconded and it was agreed to.

Mr. P. Jennings read the second part of his paper on "The Mayoralty of Truro."

On the motion of Mr. F. J. Bowles, seconded by Mr. J. R. Collins, a hearty vote of thanks was accorded to the contributors of papers and the donors of gifts to the museum and library, and on the proposition of the Rev. W. Iago, seconded by Mr. J. D. Enys, the thanks of the meeting were accorded the retiring president and the president-elect for the ability with which they had presided.

At the close of the meeting, in a new exhibition room, where refreshment was served, Sir Edwin Durning-Lawrence handed over Mr. Smallfield's beautiful picture "The Ringers of Launcells Tower" to the Institution, remarking that Mr. Smallfield had asked him where it could be fittingly placed, and he suggested inside the walls of that Institution.

The following resolution proposed by the Rev. W. Iago, and seconded by Mr. Howard Fox was unanimously passed: "That the Royal Institution of Cornwall tenders its very best thanks to Mr. Frederick Smallfield, A.R.W.S., for the valuable painting in oils, "The Ringers of Launcells Tower," which he has so generously presented to the museum and art gallery, and to Sir Edwin Durning-Lawrence, Bart., M.P., for his good offices in connection with the matter."

GIFTS AND ADDITIONS TO THE MUSEUM.

22ND NOVEMBER, 1904 TO 13TH DECEMBER, 1905.

DEPARTMENT OF ANTIQUITIES AND ETHNOGRAPHY.

Native fishing net from Dixcove, West Africa	...	Capt. Jas. Roberts.
Fragments of the smaller one of the two cinerary urns excavated at Treworrick Farm, near St. Ewe, Cornwall 18/1/1904. (The large urn was presented last year.)	... .. }	The Rt. Hon. Earl of Mount Edgcumbe.
Man-trap from Treviles	... .. }	Mr. G. F. Thomas-Peter.
Sword stated to have been used by the Captain of a Falmouth Packet	... .. }	Mr. H. G. Pool.
A selected series of ancient stone implements from Egypt, India, and France	... .. }	Mr. H. W. Seton-Karr
Pair of wooden shoes from Holland	... .. }	Mr. N. B. Bullen.

DEPARTMENT OF ZOOLOGY.

Skin of the Carpet Snake from Central Queensland	... .. }	Mr. H. E. Bellamy, C.E.
Striped Hawk-Moth (<i>Deilephila livornica</i>) caught at Hayle Towans, Cornwall	... .. }	Mr. T. J. Porter.
Tufted duck taken at Killiow, 1/2/1905	... .. }	Mr. J. C. Daubuz.
Collection of Sponges and Shells from Wellington, New Zealand	... .. }	Miss Rachel Barclay.
Fork-tailed Petrel caught at Feock, 1/12/1905	.. }	Mr. W. Dunstan.
Butterflies from the Andaman and Nicobar Islands	... .. }	Mr. C. Gilbert Rogers.
Pair of very large elephant's tusks from India	... .. }	Deposited on loan by Mr. C. Gilbert Rogers.

DEPARTMENT OF BOTANY.

<i>Comptosorus rhizophyllus</i> , Link. (Walking leaf fern) from Niagara Glen, 18/8/1904 }	Mr. J. C. Daubuz.
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DEPARTMENT OF GEOLOGY.

Fine specimen showing contortion in clay slate, from a quarry at Enys }	Mr. J. D. Enys.
Fossils from Lake Huron, Ontario	... .. }	Mr. G. W. Harvey.

Fossils :— <i>Entomis serratostrata</i> , from the Upper Devonian Slates, Polzeath, St. Minver... ..	} Mr. Howard Fox, F.G.S.
<i>Posidonomya Venusta</i> , from the Upper Devonian Slates, St. Kew, Cornwall	
Fossils :— <i>Calamites Suckowi</i> and <i>Sphenopteris Laurenti</i> from a Culm stratum near Bude	} Mr. Wm. R. Dunstan.
Large specimen of Kauri Gum from New Zealand	} Mr. Alderman T. L. Dorrington, J.P., C.C.

DEPARTMENT OF MINERALOGY.

Gold Banket from Adjah Bippo Gold Mine, Gold Coast Colony	} Capt. J. Veal.
Cabinet of minerals and geological specimens	} Mr. C. D. Gilbert.
Fine specimen of crystallized Barvtes associated with Pearlspar, from Cumberland	} By exchange.
Tantalite from S. Australia	} Mr. Benedict Kitto, F.G.S.
Triplite from Singar, Gaya District, India	

DEPARTMENTS OF MANUSCRIPTS AND DOCUMENTS.

Parish Apprenticeship Indenture by which one William George is bound to William Murdock, of Redruth, Engineer, the Churchwardens and Overseers of Redruth being the other parties. The document is signed by William Murdock, sealed with impression of his monogram and dated 10th October, 1788... ..	} Mr. John Penberthy.
Autograph letter and portrait of Samuel Drew, dated 15 July, 1821	} Mr. J. D. Enys.
Five Guinea Cornish Bank (Truro) Note, dated 27th December, 1787	} Mr. John Oliver.

DEPARTMENT OF PRINTS, DRAWINGS AND PAINTINGS.

Sketch of exterior of old St. Mary's Church, Truro, made by Wm. Varley in 1805. From this sketch a copper plate was engraved by F. C. Lewis and impressions made and issued to the public	} Sir Edwin Durning-Lawrence, Bart., M.P.
Three original copper plates engraved by F. C. Lewis from sketches by William Varley :—	} Mr. Alderman T. L. Dorrington, J.P., C.C.
1 Exterior of old St. Mary's Church, 1805 (engraved from sketch presented by Sir E. Durning-Lawrence, referred to above)	
2 Interior of old St. Mary's Church, 1806	
3 Truro from Kenwyn, showing Cavalry Barracks in distance, 1806	
Also oak frames for mounting the plates	

Engravings from two of the copper plates presented by Mr. Alderman Dorrington :—	}	Purchased.
1 Exterior of old St. Mary's Church		
2 Interior of old St. Mary's Church		
Portrait of Mr. Robert Blee, of Truro, attributed to John Opie	}	Bequeathed by late Mr. T. H. Hodge.
Oil painting "The Ringers of Launcells Tower," painted in 1887 by Frederick Smallfield, A.R.W.S. The Rev. R. S. Hawker's poem suggested the subject to the Artist. This is the larger version of one in the Old Water Colour Society (by same Artist) of 1887 ..	}	Presented by the artist through Sir Edwin Durning- Lawrence, who defrayed cost of restoring frame and covering with plate glass.
Fourteen designs submitted for the erection of the old "Assembly Rooms," at Truro	}	Mr. J. D. Enys.
Sketch, in water colours, of the Mural Painting in St. Keverne Church, by Mr. W. A. Rollason ...		
		Presented by the Artist.

GIFTS TO THE LIBRARY.

British Association Reports for 1903 and 1904 ...	}	Mr. J. D. Enys.
Life of Richard Trevithick by F. Trevithick (2 vols.)		
Reports of the Australian Association for the Advancement of Science, vols. 1 to 10 ...		
Proof Sheets corrected by Author.—Observations on Metalliferous Deposits by W. J. Henwood ...		
Report of the Congrès Geological International 4th session, 1888		
Report of Trial, Rowe v. Brenton, 3 MS. volumes...		
Fairbairn's Book of Crests, 2 vols., 1905 edition ...	}	Sir Robert Harvey.
Hitchins & Drew's History of Cornwall, 2 vols. ...		
Observations of variable stars, 1864 to 1904 ...	}	West Wendon House Observatory.
On the Island of Ictis		
Summary of Progress of Geological Survey for 1904	}	Geological Survey Office.

BOOKS PURCHASED.

Ray Society.	Monograph of the British Desmidiaceæ by W. West and G. S. West. Vols. 1 and 2.
„ „	The British Tunicata by the late Joshua Alder and the late Albany Hancock.

Ray Society. The British Freshwater Rhizopoda and Heliozoa by James
Cash, assisted by John Hopkinson. Vol. 1.

Palæontographical Society Monographs.

Whitaker's Cathedral of Cornwall.

Devon and Cornwall Record Society. Parts 1 and 2.

Nature.

Zoologist.

British Rainfall.

Symons' Meteorological Magazine.

BALANCE SHEET OF ACCOUNTS.

Dr. Arthur P. Dix, Esq., in account with the Royal Institution of Cornwall. **Gr.**

1904.		£	s.	d.	1905.		£	s.	d.		
July 31.	To Balance { General Account, £3 8 2 } Fabric { 11 0 }	...	3	19	2	July 31.	By Curator ...	...	75	0	0
"	" Subscriptions ...	...	159	14	6	"	" Repairs and Improvements ...	...	20	13	5
"	" H.R.H. The Prince of Wales ...	...	20	0	0	"	" Books, Printing, &c. ...	...	12	17	7
"	" Visitors ...	...	8	11	0	"	" Fuel and Gas ...	...	13	0	0
"	" Journal ...	...	2	11	0	"	" Rates and Taxes ...	...	1	13	3
"	" Excursion, 1904... ..	...	10	10	0	"	" Excursion, 1904 ...	...	9	6	4
"	" Do, 1905... ..	...	12	7	6	"	" Do, 1905 ...	...	14	14	9
"	" Sir Robert Harvey, special donation to Journal Fund ...	...	15	16	3	"	" Journal No. 50 ...	...	62	16	0
"	" Sir J. Langdon Bonython do. do. Case Fund ...	...	31	16	7	"	" New Cases ...	...	33	9	11
"	" Deposit account ...	...	28	13	0	"	" Insurance ...	...	4	14	0
						"	" Caretaker ...	...	5	0	0
						"	" Museum Expenses ...	...	8	5	3
						"	" Sundries ...	...	18	0	9
						"	" Balance ...	...	14	7	9
									<u>£293 19 0</u>		
July 31.	Balance { General Fund ... } Fabric { ... }	...	13	16	9						

CONSTRUCTION OF MAPS IN RELIEF.

BY H. G. HENDERSON.

(Read 23rd May, 1905).

Mr. H. G. Henderson, principal of the School of Mining, Truro, introduced an invention of his, for which we understand a patent has been secured, for map modelling or the construction of maps in relief. A series of interesting relief maps, constructed on this new system, was exhibited, consisting of "The Battle-field of Hastings" with the Norman and Saxon armies in relative positions, a similar model of the field of Bannockburn, and other relief maps of parts of Wales, Cornwall, &c. Mr. Henderson remarked that the best system of map-modelling hitherto in use consisted in laboriously building up a superstructure of thin boards, each cut by the fret-saw to the intricacies of the several contour lines on the map. On this skeleton or framework the map was finished off in plaster. If duplicates were required a clay mould had to be made from the original map and casts taken therefrom. Under the new system no boards, tediously cut to shape with the fret-saw, are required, but ordinary potter's clay is simply rolled out into slabs and the mould is built therefrom direct. A shallow wooden or zinc tray with a bottom of wire-netting is then superimposed on the mould and liquid plaster is poured in. After an hour or two, to allow the plaster to set, the cast is removed from the mould and coloured and finished in the usual manner. The clay mould is then immersed in an oil bath, where it will keep unchanged for months or years, allowing casts to be taken from the same whenever required and in unlimited numbers.

A novel feature is the filling up of the hollows of the mould with coal ashes or cinders before the plaster is poured in, by which means great economy of plaster and of weight is obtained, while the finished cast differs no whit in appearance from solid plaster and is as strong, if not stronger. In the old system relief-maps of large size had to be cast in sections—always detrimental to the "tout ensemble," but under the new method casts in one piece can be obtained of practically any size. The

whole process is simple in the extreme, and, as the lecturer observed, has been brought down to the very bed-rock of cheapness. For cheap relief-maps there should be a very wide field, not only for educational purposes in our Council Schools, High Schools, Colleges and Universities throughout the kingdom, but also for mining and geological purposes. Many an estate owner would be glad to have a map in relief of the whole or parts of his property, while as a means of advertisement we can conceive of nothing more interesting and attractive to the general public than relief maps of favourite holiday resorts duly displayed at railway stations and elsewhere. Mr. Henderson, we believe, contemplates taking steps for the manufacture of his maps by a syndicate and putting them on the market. If the proposed factory is at Truro, there would be considerable local benefit should the demand for these maps be as large as some experts confidently anticipate.

Messrs. Netherton & Worth, of Truro, will exhibit some of the new relief maps very shortly.

NOTES ON CORNISH BIRDS, 1904-5.

BY JAMES CLARK, D.Sc., M.A.

(Read 23rd May, 1905).

I am glad to find that the Lesser Tern, which has for some years been regarded as a regular spring and casual autumn bird of passage still breeds in the county. Long may the locality continue to escape observation! Though the only specimen of the Lesser Whitethroat recorded for the county was shot by Pechell at Scilly in the autumn of 1857, this bird is at least a casual visitor on autumn migration to the north-east of Cornwall between Kilkhampton and Launceston. On the 16th September last an example of the Tawny Pipit was obtained near Bodmin. The only other known county specimen was shot at Tresco by Pechell in 1868. The stormy weather that prevailed during the second week in March of the present year brought two very rare birds to our shores, namely the Ferruginous or White-Eyed Duck, an immature example of which was found in a dazed condition near Mylor on the 11th of March, and the Black Guillemot, a battered specimen of which was picked up dead near St. Anthony's lighthouse, Falmouth, on the 12th. The former has not occurred before in the county; of the latter only two instances are mentioned by Rodd, and none has been recorded since the appearance of his work.

A few days ago a parcel was forwarded to me at St. Goar containing the remains of a Melodious Warbler, a bird entirely new to Cornwall. It was an adult male shot near Sand Place, Looe, on the 12th of May, under the impression that it was a "nightingale." "We killed it" writes the sender "so that people should not laugh at us when we said we heard the nightingale in Cornwall." It is most unfortunate that this glorious singer was killed, particularly as the species seems to be making a half-hearted attempt to extend its summer range to the south coast of England.

(Read 13th December, 1905).

The tentative list of Cornish birds that I had the honour to lay before this Institution in the autumn of 1901 contained altogether 294 authenticated species, exclusive of such as had been introduced or had strayed from captivity. The investigations of the last four years have not only greatly extended our knowledge of the occurrence, migration, distribution and status of Cornish birds but have increased the number of species obtained in the county to 303. These may be classified as residents 83, summer migrants 27, winter visitors 38, birds of passage 15, casuals 68, accidentals 67, miscellaneous 5. The most interesting ornithological event of the present year has been the occurrence of a Yellow Browed Warbler at Scilly. The bird, an adult male, was killed at Tresco by David Smith, the veteran ex-gamekeeper, on the 1st of November last. This is the third specimen that has been recorded for the Scilly Isles. Another bird of great interest obtained this autumn at Scilly is the Snowy Owl, captured on St. Martin's. The only other instance of its occurrence in Cornwall was in 1838 when a storm-battered specimen was found at St. Germans. The long-lost Cornish resident, the Dartford Warbler, was discovered breeding this year at St. Buryan, its favourite haunt in the seventies, and also near Linkinhorn, so that during the past four years it seems to have gradually re-established itself in the county. Since the middle of October black redstarts, hawfinches and bramblings have been much commoner in the county than usual. For a week or so in middle November firecrests were nearly as common as goldcrests along the banks of the Fal, and in no previous autumn on record have so many hoopoes been observed. In Cornwall this bird is chiefly a spring bird of passage and its occurrence in the autumn is a rare event.

A BOTANICAL REPORT FOR 1905.

BY FRED. HAMILTON DAVEY, F.L.S.

(Read 13th December, 1905).

After the satisfactory report on the progress of botanical research in Cornwall which I was able to lay before the last annual meeting of this Institution, it may be questioned if anyone expected startling additions to our flora during 1905. Although there can be no finality to work of this kind, the time must come in connection with the investigation of the flora of any county when it will be impossible in any one year to increase the list of flowering plants by a dozen species, as was done in Cornwall during 1904, or by even a half that number. And yet to-day, thanks to the zeal of a few trained workers, I am able to add thirteen species to our already extensive list, as well as nearly a score of interesting varieties. Nor does the tale of our work end with this statement. East and west, north and south, our hills and valleys have been so carefully explored that the range of many of our one-locality and rare plants has been considerably extended. Four or five species which were formerly thought to be confined to the Lizard peninsula have been found as far away as Falmouth, Porth Towan and Cubert; and a few others which my "Tentative List" credits with just two or three localities are now known to flourish in the most distant parts of the county.

In many respects our work this year has been conducted on more systematic lines than were previously observed. To this I attribute much of our unexpected, and almost unprecedented, success. If there was one part of the county which more than any other needed mile by mile investigation, it was that portion of the north coast, with fertile valleys and wide expanses of downs running inland, lying between Newquay and Hayle, and my own researches in that tract have been largely supplemented by the untiring labours of such careful botanists as Dr. Vigurs, Mr. William Tresidder, Mr. W. Borlase, Mr. E. Richards, Mr. J. W. Jones, Dr. Drabbles and Miss Hilda Lake.

The Falmouth district, also, notwithstanding the excellent work done there half-a-century ago by Dr. H. Charlton Bastian, and more recently by Mr. Ernest Bullmore, required further attention. This I have been able to give, and in the parishes of Mabe and Budock more particularly many surprises have been forthcoming.

1. SPECIES NEW TO CORNWALL.

Under this head last year I introduced a fumitory which was quite new to Britain. To-day I am able to bring before you specimens of an eyebright which does not agree with any one of the several described British forms. It will be also remembered that at the last annual meeting I mentioned the names of seven brambles which had recently been added to our flora. Commenting on those discoveries, I said there was still much to be done before a correct history of the brambles of Cornwall could be written, and I expressed the hope that some of our resident botanists would this year embark on a serious study of the forms occurring in their respective neighbourhoods. I am sorry to say Dr. Vigurs is the only one who has responded to that appeal. When it is known that our efforts this season have resulted in the discovery of four species and two varieties new to Cornwall, perhaps others may be induced to extend their sympathy to this interesting group of plants. Mid-Cornwall, from Bodmin to Truro, offers a fine field to the diligent student. It is more or less untrodden ground, and will, I feel certain, yield a rich harvest.

Drosera anglica, Huds. In the year 1820 there appeared an unpretentious but valuable, albeit in places unreliable, little book, entitled "A Botanical Tour through various parts of the counties of Devon and Cornwall." The author was the rev. John Pike Jones, a Devonshire worthy, who in the preceding year had collaborated with a Mr. J. F. Kingston on a much more elaborate work, entitled "Flora Devoniensis." In not a few instances have modern botanists been able to show that the rev. gentleman's Cornish records must be accepted with a deal of caution, and among the plants recorded by him for Cornwall on which suspicion early fell and has continued to the present was the Great Sundew. In the little book referred to this plant is

mentioned for Marazion Marsh. Now, it is worthy of note that it was not long after the publication of the "Botanical Tour," when the extreme western portion of Cornwall began to receive a deal of attention from a number of prominent botanists, who with one accord were obliged to confess that *D. anglica* had eluded all attempts at discovery not only on Marazion Marsh, but in many likely spots both in that neighbourhood and in other parts of the county. The natural conclusion was that Jones had mistaken the Long-leaved Sundew for its congener, the Great Sundew, and so we find so cautious a writer as the author of "Topographical Botany" stamping *D. anglica* as "not sufficiently testified" for Cornwall. For this reason, also, it is marked as an error in my "Tentative List." To *Mr. William Tresidder*, of Goonhavern, belongs the honour of proving beyond doubt the occurrence of the Great Sundew in Cornwall; and this afternoon is the first time genuine Cornish specimens have been exhibited to a gathering of Cornish scientists. *Mr. Tresidder* made his happy find early in August on Ventongimps Moor, in the parish of Perranzabuloe. I soon paid him a visit, and was delighted to see the plant flourishing by the thousand.

Rubus lentiginosus, Lees. Kennall Valley, about half-a-mile below Ponsanooth, *F. H. Davey*. Devon, Hampshire, and Berkshire are, I believe, the only other southern counties from whence this plant has been recorded.

R. rudis, Wh. & N. Kennall Wood and on the edge of Barres Moor pond, near Ponsanooth, *F. H. Davey*. According to the rev. Augustin Ley, "not quite typical." Unless recently reported, this species has not been found in Devon, Somerset, or Dorset.

R. podophyllus, P. J. Muell. The Cairns, Ponsanooth, apparently very rare, *F. H. Davey*. After careful examination, the rev. W. Moyle Rogers labelled my specimens—"R. *podophyllus*, P. J. Muell, but perhaps rather young for certain determination, and it would be well to consider it as only provisionally named by me until you can supplement your 1905 gatherings by further specimens collected two or three weeks later in 1906." Hitherto Monmouth, Herefordshire, and Kent were the nearest counties credited with this variable bramble.

R. horridicaulis, P. J. Muell. On a hedge at the top of the Cairns, Ponsanooth, extending about one hundred yards, *F. H. Davey*. When Mr. Rogers published his invaluable "Handbook of British Rubi" (1900), Glamorgan and Brecon were the only British counties where this striking plant was known to occur. Almost as soon as it commences to flower, the leaves are elaborately spotted and riddled through fungoid and insect attacks, and before the fruit are ripe the whole bush wears a very woe-begone appearance.

Caucalis latifolia, Linn. This plant, which was previously known to have occurred in the counties of Devon, Somerset, Gloucester, Hampshire, Herts, Cambridge, Bedford, and Carmarthen, only, was found in June last by *Miss Boucher* in a permanent pasture at Morval, near Looe. The Cornish locality is an interesting one, as hitherto in this country it had been looked upon as a weed of cornfields.

Senecio Cineraria, DC. (*S. maritimus*, Reichb. *Cineraria maritima*, Linn). Of undoubted garden origin, but perfectly naturalized and more or less abundant on the cliffs above Newquay harbour, where it appears to have been first noticed, though only recently identified, by *Dr. Vigurs*. By reason of their attractive silvery grey foliage, the scores of plants which have obtained a footing on the cliffs stand out among other vegetation as very conspicuous objects. Torquay, in Devon, and Killiney Bay, County Dublin, are the only other places in the British Isles where this native of the Mediterranean is found in anything approaching a naturalized state. *Dr. Vigurs* is of opinion that *S. albescens*, Burbidge and Colgan, a hybrid between *S. Cineraria*, DC, and *S. Jacobaea*, Linn., also grows above Newquay harbour.

Gentiana lingulata, C. A. Agardh, var. *præcox*, Townsend (Murbeck). The type is not known to occur in Great Britain, but the variety has been detected in several counties. I was able to add it to our Cornish list in June last by finding it fairly plentiful at Porth Towan. Within a fortnight of my discovery *Mr. Edgar Richards* sent me specimens gathered at Chapel Porth, in the same parish, and about the same time *Dr. Vigurs* detected it at Newquay. From *Gentiana Amarella*, Linn., with which

it was long confounded, this plant differs by its more dwarfed stature, its earlier time of flowering, and by its calyx being oftener 4-fid than 5-fid, with the segments slightly shorter than in *G. Amarella*. *G. lingulata*, var. *præcox* commences to flower early in May, and by the first week in July leaves and flowers have disappeared and the capsules are perfectly ripe; whereas by that time *G. Amarella* has not made its appearance. In "Acti Horti Bergiani" (See "Journal of Botany," 1894, pp. 1-4), Herr Svante Murbeck expresses the opinion that *G. lingulata* has become differentiated from *G. Amarella* since the last glacial epoch.

Euphrasia borealis, Towns. Carnkief Moor, Perranzabuloe, *F. H. Davey*. Already reported for Devon, and apparently widely distributed throughout Great Britain.

E.....? During the last week in June I found a very handsome eyebright of the *Rostkoviana* type on the hillside at Porth Towan. A week or two later I found it rather sparingly on Connor Downs, and about the same time *Mr. Tresidder* reported it from Goonhavern. *Mr. Marshall*, to whom fresh specimens were sent, confessed that the plant was new to him, and that it would not come under any described British form. It is shorter and much less branched than *E. Rostkoviana*, Hayne, and has a larger and deeper violet-coloured corolla than I have seen in any other eyebright. Specimens sent to Prof. Wettstein, of Prague, the well-known authority on the genus, have not yet elicited a reply.

Salix lutescens, Kern. (*S. aurita* × *cinerea*). This hybrid willow was found by me along the banks of the reservoir, in the parish of Mabe, early in September. As the willows of Devon have not yet been thoroughly worked, I am unable to say if this recent addition to the flora of Cornwall has been found in the neighbouring county.

Potamogeton interruptus, Kit. (*P. flabellatus*, Bab.) In the Supplement to the "Journal of Botany," for August last, *Mr. Arthur Bennett* includes this species for West Cornwall. In reply to a letter, *Mr. Bennett* informed me that the plant was found in a ditch near Penzance, in August, 1875, by the late *Mrs. E. A. Lomax*, and was distributed by the Botanical

Exchange Club as *P. pectinatus*, Linn. At present records are wanting for it for Devon.

Anthoxanthum Puelii, Lec. and Lamotte. This is mentioned as a Cornish plant in the new edition of Townsend's excellent "Flora of Hampshire," (p. 481). Dr. Clark tells me he found it near Callington some three or four years ago, and sent specimens to several correspondents. Exactly thirty years ago Mr. Briggs discovered this grass near the south coast in the adjoining county (See "Flora of Plymouth," p. 357).

II.—VARIETIES NEW TO CORNWALL.

In no one year have so many varieties been discovered in Cornwall as during 1905. Many of the additions represent strongly-marked deviations from the type, one proves to be quite new to science, and a few of the remainder have a very restricted distribution throughout Britain.

Ranunculus hederaceus, Linn., var. **omiophyllus**, Tenore. This appears to be only the floating form of the type. *Dr. Figurs* has detected it in several places near Newquay, and I have found it in the Kennall Valley. It probably occurs in other districts.

Papaver Rhœas, Linn., var. **Pryorii**, Druce, in Report of the Botanical Exchange Club, 1888, p. 199. I consider this a well-marked variety. Its chief character is that the hairs on the peduncle, especially before the flowers expand, are of a beautiful dark crimson colour. Though it may not be invariably the case, the petals are of a deeper colour than in the type, and oftentimes the segments of the leaves are narrower. Specimens were first sent from Mount Hawke by *Mr. E. Richards*. Later *Mr. Tresidder* found it near Goonhavern, in Perranzabuloe parish, and *Mr. Jones* forwarded it from Perranporth.

Fumaria Boræi, Jord., var. **verna**, Clavaud. Specimens from Tresamble, Perranarworthal, which I submitted to Mr. Pugsley were referred to this rare variety. It is a shorter and more robust plant than the type, with large, deeply coloured flowers, and leaves often vinous tinted.

Var. **muraliformis**, Cl. This contribution to our list comes from *Miss J. Davey*, who found the plant by the roadside west of Penryn. A few weeks later I discovered it between St. Gluvias

Burnt-house and Barres Moor. It is a rather slender plant, with small, pale flowers, peduncles incurved, pedicels slender, variable in direction, often recurved.

F. confusa, Jord., var. **hibernica**, Pugsley. Mr. Pugsley so names a form of *confusa* which has the dark-tipped corolla of *Boræi*. It was first found in Ireland by Mr. Lloyd Praeger, where its wide distribution suggested the name which has been bestowed on it. In September I was able to send Mr. Pugsley good fresh specimens from a potato-field near Ponsanooth. Shortly before receiving them Mr. Pugsley had detected a specimen from the Scilly Isles in the herbarium of Mr. F. Townsend.

Sisymbrium officinale, Scop., var. **leiocarpum**, DC. This variety, distinguished from the type by its glabrous instead of downy pods, is, probably, generally distributed throughout the county.

Polygala serpyllacea, Weihe, var. **vincoides**, Chodat *in litt.* In this plant Cornwall gives a new and striking variety to science. When I first found it in September on Wheal Clifford Downs, in the parish of Gwennap, I was so struck with its divergence from all the British forms with which I was acquainted that I instantly despatched specimens to Mr. Arthur Bennett, asking for an opinion. Mr. Bennett, who possesses an unrivalled knowledge of British *Polygala*, was also puzzled by the stranger, and he in turn sent a specimen to Dr. Chodat, of Geneva, the monographer of the genus. Under these circumstances, Dr. Chodat's verdict, that the plant was new to science, was not altogether a surprise. Dr. Chodat very kindly drew up the following description, of which I give also a translation:—
 “Foliis ellipticis, breviter acutis subimbricatis plerumque oppositis superioribus tantum alternis, racemis terminalibus brevibus haud involucratis, alis magis ellipticis quam oblongis, crista minus divisa circa 8 loba, lobis marginalibus latioribus incisus, stylo ovario haud longiore, seminibus ellipsoideis lævibus potius patentibus parce hirsutis.” Leaves elliptical, shortly pointed, subimbricate, mostly opposite, only the upper ones alternate, racemes terminal, short, not at all involucred, wings more elliptical than oblong, crest but little divided, about

8-lobed, the marginal lobes wider and incised, style not at all longer than the ovary, seeds ellipsoidal, smooth, rather patent, sparingly hairy. Since receiving Dr. Chodat's letter, I have found the plant well distributed over the top of Carnmarth Hill. In its two localities it was associated with *Potentilla silvestris*, var. *sciaphila*, and *Ulex Gallii*, var. *humilis*. On Wheal Clifford Downs only blue-flowered examples were seen; but on Carnmarth Hill blue and pink-flowered ones were growing together.

Ulex Gallii, Planch., var. **humilis**, Planch. Many of us who have been working at the flora of Cornwall have long been puzzled about a dwarf variety of the Autumn Furze, for the most part restricted to high or exposed places. It has a general distribution from the Tamar to the Land's End. Its habit at once arrests attention. Instead of producing long erect branches, its branches are short and decumbent, and they grow so thickly together that one can easily walk on the dense masses without touching the ground. When a croft where this furze grows has been fired and the plants burnt to the ground, the shoots which are produced the following year are absolutely prostrate, and generally are more full-flowered than the branches on old plants. When I started to unravel the tangle, I collected specimens from widely separated districts. The examination which followed, and the comparison of the specimens so got together with *U. Gallii*, led to the conclusion that I had found something which had not been described in any of our British Floras. Here, again, I was driven to seek the assistance of Mr. Bennett, and after he had seen and examined fresh plants, he pronounced them to be Planchon's var. *humilis* of *U. Gallii*. I have not the least doubt that this is the plant which earlier writers recorded for Cornwall as *U. nanus*.

Rubus plicatus, Wh. & N., var. **hemistemon**, (P. J. Muell.) To this variety Mr. Rogers refers "a singular small form," collected at Colbiggan Down, Withiel, by *Dr. Vigurs*.

R. macrophyllus, Wh. & N., var. **macrophyloides** (Genev.) Wood behind Sticking-bridge, near Ponsanooth, *F. H. Davey*. I may here remark that Cornwall is erroneously credited with this variety on page 101 of "Handbook of British Rubi." Mr. Rogers informs me that South Devon, not East Cornwall, was intended.

Potentilla Tormentilla, Neck., var. **sciaphila**, Zimmeter.

A plant found by me on Wheal Clifford Downs and Carnmarth, Gwennap, is so placed by Mr. Bennett, who tells me it agrees with an authentic British specimen so named by Dr. Wolf, who is monographing the genus. The plant is generally more compact than the type, with short, many-flowered branches. The radical leaves are mostly small, almost circular in outline, generally ternate, but sometimes with four broadly wedge-shaped leaflets, which overlap. The achenes are less keeled than in the type, and (when fresh) have a number of pale longitudinal markings. The divisions of the epicalyx are more abruptly contracted at the base, and more conspicuously 3-nerved. *Dr. Vigurs* has recently found the plant at Retew, in the parish of St. Enoder.

Crepis virens, Linn., var. **agrestis**, Koch. (*C. agrestis*, Wald. & Kit.) This variety occurs in the late summer and autumn in potato and turnip fields. In the neighbourhood of Ponsanooth it is very common, and I have no doubt it will be found in most parts of the county. It is a stout, erect plant, from two to three feet high, with larger anthodes than in *C. virens*, and the phyllaries are covered with dark glandular hairs.

Leontodon autumnalis, Linn., var. **simplex**, Duby. A dwarf plant with generally a monocephalous scape. It is very frequent in the short turf on Connor Downs.

Nepeta Glechoma, Benth., var. **parviflora**, Benth. Easily recognised by the corolla tube being but little longer than the calyx, and by its smaller, hispid-pubescent foliage. Newquay, *C. C. Vigurs*. Perranzabuloe, *W. Tresidder*. Perranporth, *J. W. Jones*. Ponsanooth, *F. H. Davey*.

Galeopsis Tetrahit, Linn., var. **bifida** (Boenn.) Plant much smaller than the type, with a shorter corolla, the lower lobe of which is notched. Newquay, *C. C. Vigurs*. Goonhavern and Perranwell, Perranzabuloe, *W. Tresidder*. Parishes of St. Gluvias, Perranarworthal, Gwennap, Stithians and Mabe, *F. H. Davey*.

Polygonum Persicaria, Linn., var. **prostratum**, Breb. This variety, marked by its decumbent stems and short spikes of

flowers, is very common in potato, turnip, and mangold-wurzel fields in the neighbourhood of Ponsanooth, and I have no doubt it will be found in most parts of the county. The flowers are generally white, and the upper surface of the lanceolate leaves are rather darker than in the type.

Sparganium simplex, Huds., var. **longissimum**, Fries. To this variety I refer a plant with very long floating leaves which occurs in deep pools and swiftly running streams in various places in the parish of Wendron.

Carex paniculata, Linn., var. **simplicior**, Anders. Near Goran Haven, *Clement Reid*.

C. flacca, Schreb., var. **Micheliana**, Ar. Benn. Tregorden, Egloshayle, *R. V. Tellam*. Lizard, *G. C. Druce*.

3. NEW LOCALITIES.

The particulars furnished under this head must not be accepted as anything like a complete account of what has been done this year. Altogether, many hundreds of new localities have been added, and the selection here given refers to the rarer plants only. It will be seen that some of the records stand for a great extension of the range of species hitherto thought to be confined to very restricted areas, while several constitute new vice-county records. As there appears to be a little misconception among some of my helpers as to what is meant by a "vice-county," it may not be amiss if I offer a few words of explanation. For purposes of comparison, as well as in other ways to facilitate his great work as botanical topographer, the late H. C. Watson divided Great Britain, first of all into eighteen provinces. These provinces were broken up into thirty-eight sub-provinces and, by a further splitting, the sub-provinces were marked off into one hundred and twelve vice-counties. It would be out of place here to trace these several divisions. Suffice it, therefore, that the enumeration of the vice-counties commences with West Cornwall, which is vice-county 1, and terminates with the Shetland Isles, which form vice-county 112. Cornwall is divided into two vice-counties, "by a line traced along the high road from Truro, through St. Columb, to the inland extremity of Padstow Creek; at the two ends of this line,

the salt-water completing the division.”* That portion of the county which lies west of the line thus indicated constitutes vice-county 1, while the eastern section is vice-county 2.

In the following list an asterisk is placed before a locality when such happens to constitute a new vice-county record:—

Ranunculus trichophyllus, Chaix. Trevenper 4-turnings, *C. C. Figurs*. Tregonna, Little Petherick, *L. A. M. Riley*.

R. Drouetii, F. Schultz. Pool near the “Lost Church,” and at Mount, Perranzabuloe, *W. Tresidder*. Ditch near Perranporth railway station, *J. W. Jones*.

R. peltatus, Fries. In a horse-pond at Veryan, *Clement Reid*.

Helleborus viridis, Linn. St. Cleer, near Liskeard, *W. Borlase*. Legonna orchard, St. Columb Minor; Besaughan, St. Colan, *C. C. Figurs*.

Aconitum Napellus, Linn. Near Marsland, Morwinstow; in fair quantity in Combe Valley, Kilkhampton; a few plants on a hedgebank in the Exeter Road, Launceston, *W. Wise*.

Papaver dubium, Linn., var. **Lecoqii** (Lamotte). Hayle, *E. Drabbles* and *Miss Hilda Lake*.

P. Argemone, Linn. Goonhavern and Hendra, Perranzabuloe, *W. Tresidder*. Goran Haven, *Clement Reid*.

P. hybridum, Linn. Pentruse, St. Issey, *L. A. M. Riley*. Lambriggan, Polgoda, and Hendra, in Perranzabuloe, *W. Tresidder*. Mawla, *E. Richards*. Hayle, *E. Drabbles* and *Miss Hilda Lake*.

Meconopsis cambrica, Vig. Growing freely in a shrubbery near Menheniot Vicarage, *Canon C. E. Hammond*.

Fumaria capreolata, Linn. Wadebride, *R. F. Tellam*. Porth Towan, *E. Richards*. Treveor, Goran, *Clement Reid*.

Nasturtium sylvestre, R.Br. A few plants between Golant and Fowey, *F. H. Perrycoste*.

Alyssum maritimum, Linn. Callostock Vean, Perranzabuloe, *W. Tresidder*.

* See “Cybele Britannica,” by Hewett Cottrell Watson, vol. 4, 1859; and “Topographical Botany,” by the same author, ed. 2, 1883.

Brassica alba, Boiss. Field near Truro Workhouse, *W. Borlase*. St. Ives, *E. Drabbles* and *Miss Hilda Lake*.

Diploxix tenuifolia, DC. Trevone, *L. A. M. Riley*. Chalcotts, Perranzabuloe, *W. Tresidder*. Perranporth, *E. Drabbles* and *Miss Hilda Lake*.

Lepidium Draba, Linn. Mount Hawke, *J. W. Jones*.

Teesdalia nudicaulis, R. Br. Grassy slopes close to the sea, Goran Haven; with simple or fiddle-shaped leaves, *Clement Reid*.

Crambe maritima, Linn. Cliff on the east side of the Dodman; one large seeding plant, and several seedlings, *Clement Reid*.

Viola hirta, Linn. Carbis Bay, *E. Drabbles* and *Miss Hilda Lake*. Perranporth, *J. W. Jones*.

Polygala oxyptera, Reichb. Carnkief, Perranzabuloe; Clowance Wall, *W. Tresidder*.

Dianthus Armeria, Linn. Cliff between Coombe and Pridmouth, *E. Lee Warner*.

Silene noctiflora, Linn. Lelant, *E. Drabbles* and *Miss Hilda Lake*.

Stellaria umbrosa, Opiz. Goran Haven, *Clement Reid*.

S. palustris, Ehrh. Looe Marsh, *F. H. Perrycoste*.

Arenaria leptoclados, Guss. Goran, *Clement Reid*. St. Mawes, *F. H. Davey*. Goonhavern, *W. Tresidder*. Perranporth, *J. W. Jones*.

Sagina ciliata, Fr. Cubert, *J. W. Jones*.

S. nodosa, Fenzl. Goonhavern Moor, *W. Tresidder*.

Spergula sativa, Boenn. St. George's Downs, Perranporth, *J. W. Jones*. Very common in and for several miles around Ponsanooth, *F. H. Davey*. This plant has smooth or minutely punctulate, margined seeds; its leaves and branches are viscous and dull grey-green. In *S. vulgaris* the seeds are either devoid of a wing, or only obscurely margined, and are covered with club-shaped papillæ, which change from white to black as the seeds ripen. I have no doubt *S. sativa* will be found in most parts of the county.

Elatine hexandra, DC. The Reservoir, Mabe; not very plentiful, *N. Gill*. Loe Pool, Helston; and Tresco Pool, Scilly Isles, were the only previous Cornish localities.

Malva pusilla, Sm. Near Point Mills, Bissoe, Kea; several plants, *F. H. Davey*.

Genista anglica, Linn. Penhallow Moor, Newlyn East, *C. C. Figurs*. Goonhavern and Bozane Moors, Perranzabuloe, *W. Tresidder*.

G. pilosa, Linn. Rose Hill and Polgoda, Perranzabuloe, *W. Tresidder*.

Melilotus alba, Desr. Porthcothan, *L. A. M. Riley*. Rialton and Fistrel, near Newquay, *C. C. Figurs*. Turnip-field between Ponsanooth and St. Gluvias Burnt-house, *F. H. Davey*.

M. indica, All. In the streets and on the banks of the Camel at Wadebridge, *Clement Reed*. Mawla, *E. Richards*.

Lathyrus sylvestris, Linn. Goran Haven, *Clement Reid*.

Rubus argenteus, Wh. & N. (*R. erythrinus*, Genev.) Rose-warrick, in the parish of Lanivet; also a form with a broad straggling panicle, *C. C. Figurs*.

R. rhamnifolius, Wh. & N. Cairns, Ponsanooth; Tresamble Lane, Gwennap, *F. H. Davey*.

R. leucandrus, Focke. *The Cairns, Cot Croft, Barres Moor; all near Ponsanooth, *F. H. Davey*.

R. ramosus, Briggs. Several places near Ponsanooth; roadside between Gwinear Road station and Connor Downs; scarcely typical, *F. H. Davey*.

R. Godroni, Lec. & Lam. (*R. argentatus*, P. J. Muell.) Sunny Corner Pond, near Ponsanooth, *F. H. Davey*. Var. **robustus** (P. J. Muell.) Roadside by Cobbler's Pool, near Carnon-gate, Devoran, *F. H. Davey*.

R. pubescens, Weihe. *Two or three places in the valley below Ponsanooth, *F. H. Davey*.

R. silvaticus, Wh. & N. *Inside Blankednick Gate, near Ponsanooth, *F. H. Davey*.

R. pyramidalis, Kalt. Pelean Cross Wood, Ponsanooth, *F. H. Davey*.

R. Borreri, Bell Salt. Tresamble Lane, Gwennap, *F. H. Davey*.

R. curvidens, A. Ley. *Rosewarrick, Lanivet, *C. C. Vigurs*.

R. Leyanus, Rogers. Sunny Corner Pond, near Ponsanooth, *F. H. Davey*.

R. thyrsiger, Bab. *The Cairns, Ponsanooth, *F. H. Davey*.

R. longithyrsiger, Bab. Cot Croft, Ponsanooth, *F. H. Davey*.

R. plinthostylus, Genev. Ennisworgey, St. Columb Major, *C. C. Vigurs*. *Pelean Cross Wood, Ponsanooth, *F. H. Davey*. Plants from both localities were far more luxuriant than any Mr. Rogers had seen before.

R. cæsius, Linn. Porthcothan, St. Minver, *L. A. M. Riley*. Newquay, *C. C. Vigurs*. Common on Perranzabuloe Sands, *W. Tresidder*. Mithian and Perranporth district, *F. H. Davey*. Near Redruth, *E. Richards*.

Sedum album, Linn. By the roadside two miles on the Looe side of Menheniot Station, *F. H. Perrycoste*. Hedge west of Perranporth; Rosemundy, St. Agnes, *W. Tresidder*. St. Mawes, *F. H. Davey*.

Oenothera odorata, Jacq. Swanpool, near Falmouth, *F. H. Davey*.

Sison Amomum, Linn. Lelant, *E. Drabbles* and *Miss Hilda Lake*.

Galium uliginosum, Linn. Damp field by the roadside, Calenick, near Truro, *F. H. Davey*.

Valerianella dentata, Poll., var. **mixta**, Dufr. Near Polzeath, St. Minver; Trevanson, St. Breock, *R. V. Tellam*.

Antennaria dioica, Gært. Newlyn Downs, *C. C. Vigurs*. Budnick, near Perranporth, *W. Tresidder*.

Inula Helenium, Linn. Near Trevigue, St. Gennys, *E. Bennett*.

Bidens cernua, Linn. Marsh near Par Railway Station, *F. H. Davey*.

Anthemis Cotula, Linn. Twice seen in St. Columb Minor parish, *C. C. Vigurs*. Callestick, Perranzabuloe, *W. Tresidder*.

A. arvensis, Linn. Cornfields, Liskeard, *Cornish Moneywort Club*. Mount Hawke, *E. Richards*. Menegissey, St. Agnes, *J. W. Jones*. Ponsanooth, *F. H. Davey*. Marazion, *E. Drabbles* and *Miss Hilda Lake*.

Matricaria Chamomilla, Linn. Trenouth Farm, St. Ervan, *E. O. H. Davies*. Lelant, *E. Drabbles* and *Miss Hilda Lake*.

Senecio erucifolius, Linn. Coombe-lane, Fowey, *Mrs. W. J. Graham*.

Centaurea Calcitrapa, Linn. Field at Carnethick, Fowey, *Mrs. W. J. Graham*.

Picris hieracioides, Linn. Goonhavern, Perranzabuloe, *W. Tresidder*.

P. echioides, Linn. St. Mary's, Scilly Isles, *C. E. Salmon*. A new record for the Isles.

Hieracium aurantiacum, Linn. Carnkief, Perranzabuloe, *W. Tresidder*. Tremough, Mabe, *R. Gill*.

Hypochæris maculata, Linn. One place on the north coast between Perranporth and Godrevy, *F. H. Davey*. Hitherto Kynance Cove was the only known Cornish locality for this very rare plant.

Campanula rotundifolia, Linn. Near Mingoose, Mount Hawke, *E. Richards*. St. Erth, *E. Drabbles* and *Miss Hilda Lake*.

Anagallis cærulea, Schreb. Trewedna, Perranarworthal, *Miss N. Dunston*. Near Mawla, *E. Richards*.

Centunculus minimus, Linn. St. Columb Downs, *C. C. Vigurs*.

Microcala filiformis, Hoffm. & Link. Colbiggan Down, Withiel, *C. C. Vigurs*.

Erythræa capitata, Willd. *Cliffs around Bude, *J. Clark*. Newquay, *S. H. Bickham*.

Gentiana baltica, Murb. This recent addition to the British flora is still but badly understood by many botanists. I have long suspected it to have a wider range in Cornwall than on the Lizard Downs, where it was found by Mr. W. H. Beeby,

in 1894, and having given it special attention this year, I am able to show that it extends as far east as Hingston Downs, overlooking the Tamar. Most of the places from whence I have been able to obtain specimens were previously reported to furnish *G. campestris*; so we may infer that in all these cases *G. baltica* should replace *G. campestris*. It is more than doubtful if the last-named species really favours Cornish soil, and I shall not be surprised if it be found necessary to remove it from our list. In the following list of new localities for *G. baltica* I place in square brackets the authority for *G. campestris* for the same place. *Hingston Down, *Miss Hambly* ["Flora of Plymouth."] *Bears Downs, St. Eval, *H. Fox*. *St. Breock and *Withiel, *R. V. Tellam*. *St. Breock Beacon, *Clement Reid*. Music Water, St. Ervan, *E. O. H. Davies*. Quintrell Downs, St. Columb Major; Newlyn Downs, *C. C. Vigurs*. Rejerrah Downs and Goonhavern Moor, Perranzabuloe, *W. Tresidder*. Connor Downs, *F. H. Davey*. [Montgomery, in the Transactions of the Natural History and Antiquarian Society of Penzance, 1854].

Lithospermum arvense, Linn. A single plant on a hedge just above Padstow school, *E. O. H. Davies*. One specimen at Polperro, *rev. T. Parson*. Between Truro and Malpas, *F. H. Davey*.

Cuscuta Trifolii, Bab. St. Ervan, *E. O. H. Davies*. Trewollock, St. Columb Minor, *C. C. Vigurs*. Carnkief, Perranzabuloe, *F. H. Davey*.

Lycium chinense, Mill. (*L. barbarum*, Linn.) Reen Farm; Bolenna, near Perranporth, *W. Tresidder*.

Verbascum Blattaria, Linn. In a field near Trewint, Menheniot, *Canon C. E. Hammond*. Hendra Croft, Perranzabuloe, *W. Tresidder*. Carharrack, Gwennap, *F. H. Davey*.

Linaria purpurea, Mill. On a roadside hedge, near a garden, at Wheal Rose, St. Agnes, *F. H. Davey*.

Mimulus Langsdorffii, Donn. Marshgate, near Newton Ferrers, *Mr. Digby Collins*. Wadebridge, *L. A. M. Riley*. Abundant in the stream flowing through Longcombe, Polperro; roadside swamp, Bogga Mill, Lanreath, *F. H. Perrycoste*. Trevennen, near Goran, *Clement Reid*. Menegissey, St. Agnes,

J. W. Jones. Manor Parsley, Mount Hawke, in abundance,
E. Richards.

Euphrasia brevipila, Burn. et Grem. St. Breock Downs,
R. V. Tellam. Goran Haven, *Clement Reid.* Goonhavern,
W. Tresidder. Connor Downs; Porth Towan, *F. H. Davey* On
the Porth Towan plants Mr. Marshall reported: "This is
sparingly glandular, and comes nearest to my No. 2296 from
Mullarunny, W. Mayo, which Wettstein named "E. brevipila,
Burnat & Gremli, *forma grosse dentata.*" St. Mary's, Scilly Isles,
C. E. Salmon.

E. curta, Fries. St. Breock Downs, *R. V. Tellam.*

E. occidentalis, Wettst. Porth Towan, *F. H. Davey.* St.
Ives and Carbis Bay, *E. Drabbles* and *Miss Hilda Lake.*

E. gracilis, Fries. Goonhavern Moor, Perranzabuloe, *W.*
Tresidder. Connor Downs, *F. H. Davey.* Carbis Bay, *E. Drabbles*
and *Miss Hilda Lake.*

R. Rostkoviana, Hayne. Kit Hill, *Miss Hammond.* Marsh
at Rosenannon, St. Wemm, *Clement Reid.* Porth Towan, *F. H.*
Davey.

Orobanche major, Linn. Seaton and Talland, *F. H.*
Perrycoste. Herodsfoot, *Miss Hambly.* Polkerris, *E. Lee*
Warner.

O. amethystea, Thuill. Porth Towan, on *Eryngium*
maritimum, *Miss J. Davey.*

Mentha alopecuroides, Hull. Point, near Fowey, *R. V.*
Tellam. Penhale, Perranzabuloe, *W. Tresidder.* Hedges in
several meadows between the two railway viaducts at Ponsanooth,
certainly native; roadside between Carharrack and St. Day;
roadside Greensplat, Gwennap; Lanner Moor, *F. H. Davey.*

M. gentilis, Linn. Roadside leading from Carharrack,
Gwennap, to Crofthandy, near the former village, *Miss A. Davey.*

Thymus Chamædrys, Fr. Carnkief, Perranzabuloe, *W.*
Tresidder. Perranporth Cliffs and Mount Hawke, *J. W. Jones.*
Menegissey, Mount Hawke, *E. Richards.* Connor Downs, *F. H.*
Davey. Our Cornish plants are somewhat anomalous; the
flowers are generally sub-capitate, but the leaves are normal.

Calamintha arvensis Lam. Hendravossan, Perranzabuloe, *W. Tresidder*.

Littorella juncea, Berg. Carnkief Pond, *W. Tresidder*. Carnmenellis Moor, Wendron, *Miss J. Davey*.

Illecebrum verticillatum, Linn. Bradford Bridge, St. Breward, *Miss Williams*. Conce Moor, Lanivet; Killiers, St. Columb Road, *C. C. Vigurs*. Halsetown and Towednaek, *Clement Reid*.

Chenopodium polyspermum, Linn. Near Carnkief Pond, *W. Tresidder*.

C. opulifolium, Schrad. *Newquay; *Malpas Road, Truro, *C. C. Vigurs*.

C. rubrum, Linn. Wadebridge, *R. V. Tellam*. Falmouth Docks, *E. M. Holmes*.

C. Bonus-Henricus, Linn. Penhale Sands, abundant at several points among old mine buildings, *Clement Reid*. Pridmouth, *E. Lee Warner*.

Polygonum maritimum, Linn. Near Mullion, *H. Wallis*, teste *C. E. Salmon*.

P. mite, Schrank. Mount Hawke, *E. Richards*.

P. Bistorta, Linn. Trewarlet, Lezant, *W. Wise*. Bodmin, *R. V. Tellam*. St. Cleer, *W. Borlase*.

Salix triandra, Linn. Hendersick, between Talland and Looe, *F. H. Perrycoste*. Cosawes Wood, &c, Ponsanooth; Laity Moor, St. Gluvias; Mabe Reservoir (*forma concolor*); Trevince Moor, Gwennap, *F. H. Davey*.

S. viminalis, Linn. Talland and Trenewan, *F. H. Perrycoste*. Par; Mabe Reservoir, *F. H. Davey*.

Neottia Nidus-avis, Reichb. One plant in Polvellan Wood, near Looe, *W. Hearle*.

Epipactis latifolia, All. Chiverton Wood, Perranzabuloe, *W. Tresidder*. A welcome corroboration of the record for vice-county 1, in "Topographical Botany," which is without personal authority.

Orchis incarnata, Linn. Morval, *R. V. Tellam*. Abundant in the Land's End, *Clement Reid*.

Habenaria chloroleuca, Ridley. Coldrenick woods, *Canon C. E. Hammond*. Between Lerryn and Boconnoc; Clicker Tor, *Cornish Moneywort Club*. Higher end of Luxulyan Valley, *C. C. Vigurs*. Roadside from Carminion Cross to Trebyn Turnpike, near Bodmin, *Miss Collins*. Three places near Ponsanooth, *F. H. Davey*.

Iris foetidissima, Linn. Old Town, St. Mary's, Scilly Isles, *C. E. Salmon*. A new record for the Isles.

Polygonatum multiflorum, All. Near the obelisk, Boconnoc, Lostwithiel, *rev T. Parson*.

Allium Schönoprasum, Linn. Trelowarren Wood, near the Double-lodges, *W. Tresidder*.

Scilla autumnalis, Linn. Down above Trebarwith, *Miss C. E. Larter*. North of Bedruthan Steps; Penhale, *Clement Reid*. Holywell Bay, *H. Wyatt*. Goran, *rev A. R. Eagar*.

Typha latifolia, Linn. Damp hollow in the middle of Penhale Sands, Perranzabuloe; very dwarfed, *Clement Reid*. Pencalenick Pond, *Miss Hilda Lake*. Mawgan Valley, *C. C. Vigurs*.

Sparganium neglectum, Beeby. Marsh above Swanpool, *F. H. Davey*. Lizard and "West Cornwall" were the only previous records.

Lemna trisulca, Linn. Gyllingvase marsh, Falmouth, *F. H. Davey*. Near Ellenglase, Cubert, *W. Tresidder*. Hitherto only known to occur around the Lizard.

Alisma ranunculoides, Linn., var. **repens** (Davies). *Treburrick, St. Merryn, *L. A. M. Riley*.

Potamogeton natans, Linn. Tresco, Scilly Isles, late *W. Curnow*, *teste E. Drabbles*. A new record for the Isles.

P. perfoliatus, Linn. Very plentiful in Mabe Reservoir, *N. Gill*. Tresco, Scilly Isles, and the Loe Pool were the only previous records.

Zostera marina, Linn. St. Ives, *Rupert Vallentin*. Marazion, *E. Drabbles* and *Miss Hilda Lake*.

Cyperus longus, Linn. Marsh above Mennick Bay, St. Issy, *E. O. H. Davies*. Carne, in Veryan parish, *Clement Reid*. Dr. Vigurs tells me cats are particularly fond of the flowers of this plant.

Scirpus Caricis, Retz. Foot of Mount Hill, Perranzabuloe, *W. Tresidder*.

Carex rostrata, Stokes. North of Bray Down; Colbiggan Down, *C. C. Vigurs*. Trelawny Marsh, *F. H. Perrycoste*.

Milium effusum, Linn. Luxulyan Valley, south of the big wheel; Rees Wood, Perranzabuloe, *C. C. Vigurs*. Warleggan, *R. V. Tellam*.

Phleum arenarium, Linn. Penhale Sands, Perranzabuloe, *W. Tresidder*.

Calamagrostis epigeios, Roth. Trebartha Hall, *W. Borlase*.

Gastridium australe, Beauv. Carnkief farm, Perranzabuloe, *W. Tresidder*. Bolingey, near Perranporth; Mawnan, near the church, *W. Borlase*.

Deschampsia flexuosa, Trin. Polperro, *F. H. Perrycoste*. Fraddon Downs, St. Enoder, *C. C. Vigurs*. Trewince, Gerrans, *F. J. Polkinghorne*.

Trisetum pratense, Pers. Near Truro Workhouse; Mawnan-Smith Churchyard, *W. Borlase*.

Avena fatua, Linn. Trerose, Mawnan, *W. Borlase*.

Poa compressa, Linn. On walls at Looe, Fowey and Par, *R. V. Tellam*. Perranporth, *W. Borlase*.

Glyceria aquatica, Sm. Marazion Marsh, 1878, Herb. late *W. Curnow*, teste *E. Drabbles*.

G. maritima, Mert. & Koch. The Gannel, Newquay, *C. C. Vigurs*.

Festuca arundinacea, Schreb. *Damp meadow under The Crag, Maenporth, *F. H. Davey*.

Bromus secalinus, Linn. Launceston, very plentiful among corn, *W. Borlase*. Trevanson, St. Breock, *R. V. Tellam*.

Lolium temulentum, Linn. Malpas, near Truro, *W. Borlase*.

Hordeum secalinum, Schreb. Malpas road, Truro, *C. C. Vigurs*.

Hymenophyllum tunbridgense, Sm. Cheesewring, Liskeard, *Canon C. E. Hammond*. Roche Rock, *Miss E. Bennett*.

Cystopteris fragilis, Bernh. Crackrattle Moor, *L. A. M. Riley*.

Lastræa Oreopteris, Presl. Newquay, *C. C. Figurs*.

Polypodium vulgare, Linn., var. **serratum**, Willd. Remarkably fine plants in the woods at Prideaux Place, Padstow, *J. D. Enys*. Mr. Enys brought me beautiful fronds nearly three feet in length.

Equisetum maximum, Lam. Goran, *C. C. Figurs*.

Chara fragifera, Durieu. Mabe Reservoir, *F. H. Davey*. An addition to the range of a very rare plant.

Nitella translucens, Agardh. Not uncommon in the deeper parts of Mabe reservoir, *F. H. Davey*.

4. EXCLUSIONS.

On two previous occasions* a total of forty-eight plants were shown to have been wrongly reported for Cornwall. With several it would have been a sheer waste of time to discuss even the possibility of their occurrence; from the first it was obvious the recorders were misled. Where there was the slightest suggestion of doubt about a species, I carefully followed the trail of evidence that had been offered in its favour, until a clear case was made out for its exclusion. Much of this work involved a lot of tedious search through herbaria and books, but the labour was justified by the results. Only those who have collected material for a County Flora can fully understand how easy it is to be misled, even by the best-intentioned persons. The first duty of a compiler of a local flora is to test every record to which the least shadow of doubt attaches, especially when dealing with segregates and other critical species. This I have continued to do, and twelve more species must now be placed in the list of exclusions.

Silence conica, Linn., was first recorded by me as a native of Cornwall on the authority of Mr. W. N. Winn, who reported it for "Cliff fields near the Lizard."† At my request, Mr. Winn has recently re-examined his specimens, and he admits there

* See Journal R.I.C., vol. xvi, 66 and 250.

† See Journal R.I.C., vol. xiv, 371.

is just grounds for doubt, and suggests it be placed among exclusions. None of the western counties seen to possess this plant.

Medicago minima. Desr. When I was preparing my "Tentative List," the late Canon S. Rogers included this species in a paper which he sent me containing the results of his field work around Carbis Bay. Recently I have gone through my late friend's herbarium, but have found nothing which I could accept as the plant so recorded. *Medicago minima* is essentially a native of the eastern counties, and with our present knowledge the Cornish record, like the old ones for South Devon and North Somerset, cannot be seriously entertained.

Vicia sylvatica, Linn. Although I have not the slightest hesitancy about rejecting this, it must be admitted that botanists unacquainted with the Cornish flora would naturally expect to meet the plant west of the Tamar. From Devon right away through the southern, midland, and northern counties, even to Caithness, it has a home. Still, I have yet to discover that anyone can produce a *bona fide* Cornish specimen, or name a botanist of repute who has seen the plant *growing* in the county. It was first published as a Cornish species by F. P. Pascoe, in the "Botanical Gazette," 1850. Mr. Pascoe had not seen specimens, and he admitted the plant, like several others, was placed in his list at the request of a Mr. Ward, who thought he had seen it growing somewhere near Crowan. The next, and only other, mention of *V. sylvatica* for Cornwall was by a Mr. C. B. Allen, who claimed to have found it at Trevayler, near Penzance. His so-called discovery, like several more of like status, was announced in the Annual Report of the Royal Cornwall Polytechnic Society for 1871, but it was never countenanced by the late Dr. Ralfs, who devoted the best part of a long life to the flora of the neighbourhood of Penzance.

Rubus saxatilis, Linn. In the second edition of "Topographical Botany" (1883) this species is placed after vice-county 2, but without personal authority. As I understand by a letter received from him, the rev. W. Moyle Rogers knows no Cornish locality for the plant, and in his "Handbook of British Rubi" East Cornwall is cited for it solely on the strength of the

record in "Topographical Botany." Seeing how thoroughly the greater part of vice-county 2 has been worked by a number of critical botanists with never a trace of the plant being found, it seems strange that no one has challenged the record. This, I suppose, is partly due to the high regard all botanists have for "Topographical Botany," and partly to the fact that the presence of the plant in the sister county has been placed beyond cavil by no less an authority than the late Mr. Archer Briggs. After a deal of search, I am now able to show that the first hint British botanists had of *R. saxatilis* growing in Cornwall was from the rev. W. T. Bree in Loudon's "Magazine of Natural History," vol. 4, 1831. The place where it is there stated to have been found is "near Bodmin." Now, if Mr. Bree had devoted several years to the flora of Cornwall, instead of recording what he saw during a few days' absence from his Warwickshire rectory, and if so careful and industrious a botanist as my friend, Mr. Tellam, had not for upwards of half-a-century explored every inch of the country around Bodmin, to say nothing of the many visits to that locality of Mr. Briggs, when he was studying the brambles of the two western counties, there would be no reason for doubting the occurrence of *R. saxatilis* in Cornwall. But I am bound to confess the evidence against the plant is too overwhelming for it to appear any longer in our list.

***Enanthe silaifolia*, Bieb.** Plants collected by Mr. A. O. Hume and myself near Morval Lodge, in the East Looe valley, seemed at the time to answer to this species and were so recorded by me for vice-county 2 in vol. xiv, 373, of the Journal of this Institution. Quite recently I have submitted my specimens to the rev. E. F. Lintou, who pronounces them *Æ. Lachenalii*, Gmel. Mr. W. P. Heirn tells me the plant must be also deleted the Devon list.

***Rhinanthus major*, Ehrh.** My "Tentative List" quotes three records for this plant. "Trelew, Mylor," Miss Warren, Herb. Royal Horticultural Society of Cornwall. "Near Falmouth, rare," W. P. Cocks, vide Dr. H. Charlton Bastian's paper in the Annual Report of the Royal Cornwall Polytechnic Society, 1856. "St. Ives," W. N. Winn. Such as it is, I have examined Miss Warren's specimen, and find it nothing but a poor example of *R. Crista-galli*, Linn. Mr. Winn has again

looked up his plant, and is satisfied that it is not what he at first thought it to be. Mr. Cocks was, of course, a zoologist rather than a botanist, and I think we are safe in concluding that in the case under notice there was some little confusion on his part. Mr. Hiern accepts it as a Devon species.

Orobanche elatior, Sutton. This is for the most part a calcicole subject. It appears to come as far west as North Somerset, but I cannot find any authentic record for it for Devon, and I am satisfied it must be excluded the Cornish list. Miss Warren thought she found it at Cubert Porth, but the specimen so labelled by her in the Herb. of the Royal Horticultural Society of Cornwall, and which Mr. F. P. Pascoe reported to H. C. Watson, is undoubtedly *O. minor*, Sm. Specimens gathered by me at Ponsanooth also turn out to be that species; and Mrs. L. C. Foster's record for Gunwalloe, as well as Dr. Montgomery's for the Scilly Isles, must be similarly rearranged.

Salix phylicifolia, Linn. While admitting there is a lot of virgin ground to be broken before a correct account can be written of the willows of the west, we are no longer justified in claiming for Cornwall a plant which is almost as truly northern in its range as *S. herbacea*, Linn. And, after all, it is rather a poor way of promoting science by passing off as a Cornish plant an unlocalised and undated specimen in the Herb. of the Royal Horticultural Society of Cornwall.

Juniperus nanus, Willd., is really a Scottish plant, and after a careful comparison of the Gue Graze example with authentic specimens of *J. nanus*, I am satisfied it must be referred to *J. communis*, Linn., var. *intermedia*, Nyman. This view was adopted in part by H. C. Watson, and the late J. Cunnack was also so convinced that our Lizard plant should go under the commoner species that he suggested it should be called *J. communis*, Linn., var. *prostrata*.

Damasonium stellatum, Pers. This is the second impossible plant which Mr. Bree claimed to have seen when he visited our county. H. C. Watson made a careful examination of Gulval Marsh a year or two after Mr. Bree's visit, and went away doubting if the plant ever grew there. Dr. Montgomery, in the Transactions and Report of the Penzance Natural History

and Antiquarian Society, 1854, tells us he could never find the plant, and in his MS. "Flora of West Cornwall" Dr. Ralfs lets us know his search had been as fruitless as those of his predecessors. Neither of the four western counties can claim *D. stellatum* as a native.

Butomus umbellatus, Linn., was included by the Misses L. and M. Millett in a list of the wild flowers of the Scilly Isles, which was printed in the Transactions and Report of the Penzance Natural History and Antiquarian Society, 1853. Almost one of the first things which Dr. Ralfs, Mr. W. Curnow, and Mr. Tellam did when they next crossed to the Isles after the publication of that paper, was to look up the Flowering Rush; but then, as well as on several subsequent visits, their search was doomed to failure. Even in Devon, from whence it has been recorded for a few localities, doubt may be expressed on the indigeneity of the plant. In all probability what the Misses Millett saw on the Scilly Isles were cultivated specimens.

Cryptogramme crispa, R.Br. Mr. Winn has this year revisited St. Ives, where he thought he found this fern in 1895, and he finds he was mistaken. His record will be found in a paper by me in the Journal of this Institution, vol. xiv, 376.

In conclusion, I desire to express my indebtedness and thanks to the following gentlemen for their constant attention and valued advice:—Mr. Arthur Bennett, Mr. James Groves, Mr. W. P. Hiern, rev. Augustin Ley, rev. E. F. Linton, rev. E. S. Marshall, Mr. H. W. Pugsley, rev. W. Moyle Rogers.

PORTRAITS OF CORNISH MEN.

The council of the Royal Institution of Cornwall hope to give from time to time in the Journal portraits of Cornishmen of past times. The two portraits given in this number are from the original drawings in the National Portrait Gallery and are reproduced by the permission of the trustees. The reproductions are the copyright of Mr. Walker Emery, of London.

CHARLES INCLEDON.

DRAWN 28TH OCTOBER, 1798, BY GEORGE DANCE, R.A.

Benjamin, or, as he afterwards called himself, Charles Incledon was born at St. Keverne in 1763, the son of a medical man. He was a wild lad. After singing a short while in Exeter Cathedral choir, he ran away to sea, but his beautiful voice attracting attention, he left the navy and came forward as an actor. He first appeared at Southampton in 1784 but as an actor was not successful. His rich tenor voice and great musical capacity, however, soon made him a favourite especially at Covent Garden, where he came to be recognised as the foremost singer of the day. He is said never to have sung a false note, and to have had a natural range from *A* to *G*, and a falsetto range from *D* to *F*. He sang much in oratorios, but his forte was the ballad, and hunting and sea songs. Many amusing stories are told of him, not always to his credit. Indeed it must be confessed he was a careless reprobate, though a loveable man. He retired in 1822 and died in 1826.

VICE-ADMIRAL BLIGH.

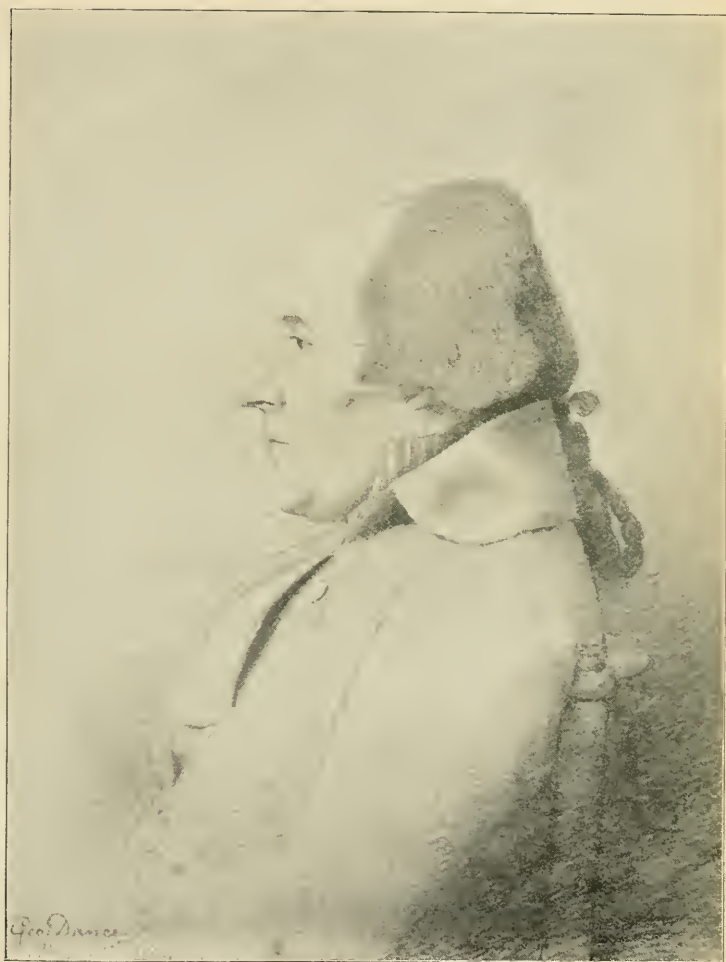
DRAWN 31ST MAY, 1794, BY GEORGE DANCE, R.A.

William Bligh was born somewhere in the east of Cornwall about 1753, but nothing is known of his parentage. He entered the navy and accompanied Captain Cook in the



CHARLES INCLETON, Drawn 28th October, 1798,

By George Dance. R.A.



VICE-ADMIRAL WILLIAM BIGH, Drawn 31st May, 1794,

By George Dance, R.A.

“Resolution” on his second voyage round the world, 1772-1774. In the course of this voyage was discovered the fruit that gave Bligh his nickname of “Breadfruit Bligh.” In 1787 he was appointed to command the “Bounty,” the mutiny of whose crew off Otaheite in 1789 and their settlement on Pitcairn island is such a well known tale. The mutiny seems to have been caused by excessive harshness on his part, but his courage and resource in saving himself and those sent adrift with him in an open boat without a chart won promotion for him. He showed great courage at the mutiny of the *Nore* in 1797, and at Copenhagen in 1801, where he commanded the “*Glatton*,” he was sent for by Nelson and openly thanked for his services. In 1805 he was appointed governor of New South Wales, but his harsh temper soon led to his deposition. In 1814 he was made vice-admiral of the blue. He was F.R.S., and in 1794 received the gold medal of the Society of Arts. He died in London in 1817.

THE MAYORALTY OF TRURO.

PART II. ⁽¹⁾

BY P. JENNINGS.

The Capital Burgesses alone possessed the privilege of electing parliamentary representatives of the borough, and the struggle for supremacy in the Corporation between rival political parties was therefore at times very severe.

At the beginning of the eighteenth century, the families of Boscawen and Vincent led the opposing factions, and for many years the issue was doubtful. Ultimately, the latter party was victorious, and on 9 October, 1722, four of its number were elected aldermen. One of these, Walter Jones, was chosen as mayor, and the retiring mayor succeeded him as alderman. Jones had been mayor in 1698 and in 1710, and had taken a prominent part in the disputes of the time. His debts had been paid by Lord Lansdowne, but this did not satisfy the opposing party, and he was subjected to much angry criticism. The feeling against him ran so high, that before he had been in office two months, he was "threatened to be prosecuted for, and on account of, his proceedings in the execution of his said office of may^r." He weathered the storms, however, and it being feared that a change of officials might be to the advantage of the Tregothnan party, the whole of the aldermen and the mayor were re-elected in 1723.

At the close of 1717, "old Vincent of Cornwall" died,² and his son Nicholas succeeded to the leadership of his faction. Nicholas Vincent was a notable man, and possessed great influence. He was assay master of the Stannaries, "an office generally given to some gentleman of quality in the county" (Tonkin); and he represented Fowey in the parliament of 1722-27. In 1722 he was elected a capital burgess of Truro, and two years later was mayor; he was re-elected mayor in 1725, but failing health compelled him to resign his office in March 1726,

¹ Part I. will be found at page 228, above.

² See News Letter, 31st Dec., 1717. MSS. of Duke of Portland.

and he died on the following 1 July. He had mortgaged his estates, and after his death the family sank into obscurity, and soon became extinct.

The resignation and death of Vincent seem to have upset the balance of power in the corporation, and the entries in the election books for the period are confusing. Zachary Williams was chosen to succeed Vincent, in March 1726, and at the same meeting Richard Plint was elected mayor. Williams, however, undertook the mayoral duties, and not until 12 August, 1727, was Plint sworn into the office by Williams, who is described as "then mayor." It would seem that Plint was actually mayor for two months only, as on the following 9 October he was succeeded by Henry Luke. These three mayors were officials connected with the port of Truro. Williams was collector of customs at a salary of £40 per year, but on 11 January, 1736-7, he was "dismissed for frauds and neglects," and was succeeded by Thomas Quarue, whose salary was raised to £50. Either Plint or his father was a goldsmith in Truro in 1705; he was appointed a tidesman in the port, 5 February, 1732-3, but was dismissed 15 January, 1735-6. The name of "Plint's Barn" is suggestive of the association of his family with the town. Henry Luke succeeded Henry Slade as a waiter and searcher 21 January, 1729-30—an office which he retained until his death in July, 1732.

John Hussey, son of Rev. John Hussey, vicar of Oakhampton, settled in Truro in the earlier part of the eighteenth century. He was a distinguished lawyer, and took an active part in the public life of the town; on 9 October, 1722, he was elected town clerk, a position which he held for fifteen years. Twice during that period, in 1728 and 1733, he united the offices of town clerk and mayor; but apparently this arrangement led to abuses, which caused the corporation to adopt the following resolution: "If the present mayor doth, or any subsequent mayor shall, at any time, presume to grant any leases or reversions of any of the borough lands without the assistance or consent of two of the aldermen of the borough, such mayor shall forfeit for every such offence the sum of one hundred pounds to be levied by distress and sale of his goods and chattells, and to be applied to the use of the poor of the said borough." Before

his death, Hussey became seriously involved in financial difficulties, and bequeathed to his children a legacy of debts.

His second son, Richard, who was born in Truro in 1713, followed his father's profession, and became a lawyer. Clever, industrious, genial, he rapidly rose to eminence, and restored the fallen fortunes of his family. Among his appointments were: attorney-general to Queen Charlotte, auditor of the duchy of Cornwall, and of Greenwich Hospital, and counsel to the East India Co. In the parliament of 1761—68 he represented St. Mawes, and was elected for East Looe in the succeeding parliament; but he died in Truro in September 1770, before this parliament was dissolved. On the 9th of October, 1768, he had surrendered his office of capital burgess, and his resignation was, after a request to him to continue in office had been made and declined, accepted. John Warrick, mayor in 1772, succeeded him as alderman, but the vacancy in the corporate body was not filled until 4 August, 1775, when John Rose, who was mayor in 1783, was appointed. In Polwhele's list, Rose re-appears as mayor in 1799; but the official list in the council chamber gives George Thomas as mayor in the latter year.

Hussey found a powerful friend in Lord Camden, but Polwhele observes: "I believe his only patron was his own talents." He was exceedingly popular in Truro, and Mrs. Smith, referring to him in "Life Review'd," says:

"His council sorrow sooth'd, blind rage disarmed,
And, as a well-tun'd lute, his language charmed."

He built the house at Killiganoon, and made it his country home, his town residence being the "Great House" at the corner of Princes Street and Green Street. He never married, and after making provision for his servants, many of whom had grown old in his employ, left the residue of his large fortune to his sisters. Richard Hussey was mayor in 1748, and few, if any, of the distinguished men who have held that office, were held in higher esteem for kindness, soundness of judgment, and real ability, than he.

Christopher Bradlick, who was appointed coroner of the borough, 16 August, 1727, and rector's warden in 1728, was elected to the aldermanic bench, 9 October, 1729, that he might

qualify for the position of mayor, to which he was called at the same meeting of the corporation.

The elections, 9 October, 1732, were distinguished by the determined opposition of Samuel Foote, Esq., and Mr. Zachary Williams to all the nominations of the majority of capital burgesses. John Prowse, who had won the esteem of the town-folk generally during his mayoralty, 1711—1721, was now an old man, and the corporation had determined to do him honour by placing him once more in the mayoral chair; he was accordingly elected alderman and mayor against the wishes of Messrs. Foote and Williams, the former of whom voted for Robert Coster, and the latter for John Hickman. Both Prowse and Hickman died before the former's term of office expired; and this is the first instance on record of the death of the mayor of Truro during his mayoralty. The capital burgesses, at a meeting held 13 August, 1733, unanimously elected James Michell, one of the four aldermen of the borough, to be mayor in the room of John Prowse until the ninth day of October following, and from thence until a new mayor should be elected and sworn. Sixteen signatures were appended to the minute, but Messrs. Foote and Williams were absent.

Stephen Tippett was elected mayor in 1735 (in opposition to the wishes of Williams) and again in 1749. His father, John Tippett, had married Mary Honeycome, and had settled at Bosvisick farm, Kenwyn, where Stephen was born, 26 August, 1693. He maintained an active connection with the corporation until 9 October, 1761, when he vacated the office of alderman. Twelve months later he had the satisfaction of seeing his son, Peter Tippett, elected to the mayoral chair, and in May 1764, he died. Peter Tippett was collector of customs at Truro, where he had been born 28 August, 1733. By his wife, Elizabeth Collins, second daughter of Edward Collins, vicar of St. Erth, he had nine children, one of whom, Edward Tippett, was rector of St. Allen.

In 1736, and again in 1751, the capital burgesses elected as mayor a very distinguished townsman, named Michael Russell. Although not a native of Truro, being possibly a son of Michael Russell, of Bideford, he had settled in the town as a physician,

and had a country seat at "Shyflok" (Seviok?) Mrs. Smith, who knew him personally, has described him as a generous gentleman, of great fortune, and of religious life. We can well understand that in him, the rev. Samuel Walker, who was then a curate at St. Mary's, would find a willing and earnest helper in his efforts to raise the standard of morals in this "town of dissipation" (Polwhele). Russell's arms were engraved on Thomas Martyn's large map of Cornwall, published in November, 1748.

It is a matter of common observation that for centuries Truro has been favoured by the services of a succession of men whose public spirit, ability, and wealth would have won for them high positions in towns of far greater size and importance. Reference to many of these men has already been made; but in the long list of mayors, there is no one whose memory is more justly venerated than that of William Lemon—"the great Mr. Lemon," as he was styled. He was made a capital burgess 9 October, 1731, and two years later was chosen as an alderman, Stephen Tippett being elected to like positions at the same dates. In 1737 he succeeded Michael Russell as mayor, and in 1750 was again elected, being preceded in the office by Tippett and followed by Russell. His only child, William Lemon the younger, was also a capital burgess, being admitted at the same meeting of the corporation as that in which his father was elected mayor for the second time. In 1755 he succeeded to the chief magistracy, and died two years later, at the early age of 33 years. He gave promise of being a man of great business aptitude, and had he lived, would doubtless have become one of the leading men of Cornwall.

Hugh Mander was elected a capital burgess with William Lemon and Stephen Tippett on 9 October, 1731, and succeeded John Hussey as town clerk 8 August, 1737. Like him, he held the office of mayor and town clerk simultaneously, being chosen mayor in 1738, and again in 1752; in 1740 he was under sheriff.

The mayors of this period also included Richard Peters, 1730, 1739, and 1753, for several years "one of the churchwardens of this borough;" Amos Prowse, 1740, perhaps a son of John Prowse; and Johnson Vivian, 1741, 1754.

In 1745, 1757, and 1766, James McCarmick, a wine merchant, and a man of great influence, was mayor. Of his two daughters, one became the wife of Sir Michael Nowell; and the other, Philippa, was married to John Allen, son of Michael Alleyne or Allen, of Seviock; his misdeeds will be noted later on. McCarmick's distinguished son, was mayor in 1771. He was a Tory, and, at the elections for the parliament of 1784, succeeded, with William A. S. Boscawen, in defeating the Whig nominees of Sir Francis Basset; but he resigned his seat in 1787 on being appointed lieutenant-governor of Cape Breton Island. He twice married; his first wife being the heiress of Bowen, of Wales; his second, Catherine, daughter of James Buller, of Morval. By the former marriage he had no issue; by the latter, only two daughters remained alive in 1820 (C. S. Gilbert). At his decease, which took place rather suddenly at West Looe, 20 August, 1815, the male line became extinct. Polwhele says, "his life has been marked by various events. In that life we see honour, spirit, integrity, and Christian piety most eminent." In his "Traditions and Recollections," Polwhele again referring to him, gives the following summary of his life:—"General James (*sic—in error for William*) McCarmick succeeded his father as wine merchant at Truro; he bought Penhillick [re-naming it 'Penmount'], and rebuilt the mansion house on the summit of the hill; he pulled down almost every hedge about the place, flung open his doors to all, attracting the high and low by politeness, and gaiety, and festivity; through a lucky lot was returned M.P. for Truro; raised a regiment of which Jamaica was the grave; was governor of Cape Breton; printed a volume of sermons for the use of his government; and, with all his vanity, and all his profusion, had a truly good heart, and died as he lived, an unshaken believer in Revelation."

One of the General's friends in Truro was Dr. Wolcot ("Peter Pindar"), who practised for some years in the town as a physician. Wolcot was both feared and detested by the leading inhabitants, owing to the satirical, and often offensive, jests of which he made them the subjects; and once in conversation with McCarmick, he went so far as to provoke a challenge to a duel. I give the story in Wolcot's words: "We had passed the previous afternoon together, when something I said more

severe than I ought to the General, roused his anger. He retorted. I was more caustic than before. He went away, and sent me a challenge for the next morning. Six o'clock was the hour fixed upon; the ground to be the Green at Truro, which at that time was sufficiently retired. There were no seconds. The window of my room, however, commanded the Green. I had scarcely got out of bed to dress for the appointment, when pulling aside the curtains, I saw the General walking up and down on the side next the river half an hour before time. The sun was just rising cloudily, the morning bitterly cold, which, with the sight of the General's pistol, and his attendance on the ground before the hour appointed, were by no means calculated to strengthen my nerves. I dressed, and, while doing so, made up my mind it was great folly for two old friends to pop away each other's lives. My resolution was speedily taken. I rang for my servant girl. "Molly, light the fire instantly, make some good toast, let the breakfast be got in a minute or two." "Yes, sir." My watch was within a minute of the time. Pistol in hand, I went out the back way from my house, which opened on the Green. I crossed it like a lion, and went up to McCarmick. He looked firm, but did not speak. I did. "Good morning t'ye General." The General bowed. "This is too cold a morning for fighting." "There is but one alternative," said the General. "It is what you soldiers call an apology, I suppose? My dear fellow, I would rather make twenty, when I was so much in the wrong as I was yesterday, but I will only make it on one condition." "I cannot talk of conditions, sir," said the General. "Why, then I will consider the condition assented to. It is that you will come in and take a good breakfast with me, now ready on the table. I am exceedingly sorry if I hurt your feelings yesterday, for I meant not to do it." We shook hands like old friends, and soon forgot our difference over the tea and toast; but I did not like the pistols and that cold morning notwithstanding. I believe many duels might end as harmlessly, could the combatants view the field as I did from my window, and on such a cold morning too."

Christopher Masterman, a merchant of Truro, was mayor in 1746; he was grandfather of Thomas Clutterbuck, mayor in 1796 (?) and of Henry Clutterbuck, M.D. (1767—1856), a dis-

tinguished medical writer, who served his apprenticeship under another mayor, James Kempe.

The next mayor, rev. Thomas Herle, was the former of two clergymen who have held the mayoral office in Truro. He entered the corporation, 9 October 1738, as the successor of Patherick Lang, deceased; but his election was opposed by three burgesses, one of whom was Zachary Williams; and possibly it was their action, then and subsequently, which led him to surrender his office at the end of the corporate year; he was, however, immediately re-appointed, and apparently without opposition. He was again mayor in 1763. The corporation was empowered to elect "six of the most substantiall, discreet, and wise tinnners within the limitts and precincts of H.M.'s Stannary of Tywarthayle as Stannators to the Convocation or Parliament of Tinnners." To the parliament held at Lostwithiel, 28 August, 1750, and to that held at Truro, 25 August, 1752, the burgesses elected, among others, three former mayors—William Lemon, the elder, Richard Hussey, and rev. Thomas Herle.

On 19 April, 1754, William Pascoe, gent., was elected town clerk, in succession to Mander, and ten days later entered the corporation in the place of John Roberts, mayor in 1744. Pascoe was under-sheriff in 1755, and was chosen mayor in 1758, but died on 30 January, 1768, during his second term of office. Richard Jewell's municipal career was very similar to that of Pascoe. He was elected coroner of the borough, 9 October, 1753, was appointed a capital burgess with Pascoe, 29 April, 1754, succeeded him as mayor in 1759, and acted as deputy mayor after Pascoe's death.

MURAL PAINTING OF ST. CHRISTOPHER IN ST. KEVERNE
CHURCH.

In the last volume of this journal is a description of this interesting picture, and a hope is there expressed that an illustration would be given in this present volume. The wall surface is so broken, the picture itself so injured, and the superimposed 17th century decoration so mixed up with the painting itself that photography, though more than once attempted, has proved unsuccessful. Fortunately Mr. W. A. Rollason, of the Truro School of Art, came to our aid, and we here reproduce the large drawing made by him on the spot in September, 1905. The plate does not do justice to the original drawing, which is coloured, but the funds of the institution have not admitted of a facsimile reproduction.

The drawing (which is preserved in our library) has the great merit of absolute fidelity—nowhere is a line or form introduced that did not exist when the artist made his copy, and the broken portions of the plasterwork, on which the wall-painting was originally executed, have been entirely omitted. Unfortunately, the picture itself is less perfect than when the paper on "Mural Paintings in Cornish Churches" (volume xv) was compiled, and is still going worse; the plaster has lost its "nature" and is daily flaking off. This has prevented further clearing of the top ornamentation, part of which (*e.g.* the arch carrying the words "Prais yee the Lord") is so conspicuous. This arch is coloured slate gray, as is all of the superimposed painting. It is especially conspicuous in the trellis work hiding Christopher's right shoulder in the centre panel, in the arch behind him, in the trellis work behind the arch (red) of the hermit's cell, and in the bands that cross the second panel on the left. The top left-hand panel has been slightly uncovered, and probably represents the arrival of Christopher at Dagon's court in Samos, when he planted his iron staff in the ground, and it forthwith put forth leaf and bloom. The other panels on this side and the three lower panels on the right are correctly



Painting of St. Christopher on P



Arch of North Doorway

North Door

Wall of St. Keverne Church.



Painting of St. Christopher on North Wall of St. Keverne Church.

described in vol. xv of this journal, though the beast in the second panel upwards appears to have a bird's head rather than a dog's. The chronological order of events in the legend requires us to descend on the left and ascend on the right, for the scene of the iron chair preceded that of the shooting. The intermediate panel representing Christopher as one of the cynocephali (if this is what it does represent) seems out of place, unless we conclude that the saint having been elsewhere represented as entirely human in shape (in contradiction to the legend) the artist took this opportunity of reminding us of the story. When the iron chair had given way, Christopher started up and prayed, and his face was full of a glorious light. This so alarmed the king that he fell from his throne and lay a long time on the ground. Then arising he addressed some abusive remarks to Christopher, and calling him an "evil beast" (*fera mala*) ordered him to be shot. This expression perhaps gave the artist his opportunity. We think, too, this ascent on the right gives us the explanation of the top panel, in which could till recently be seen a small figure seated and a tall one standing by him. Probably this represented Christopher telling Dagon how to cure his wounded eye by making clay with the saint's blood, which he prophesied he should shed upon the morrow.

On the rocks to the left of the centre panel note the head of a dog (much like a modern pointer, outlined in gray and shaded yellow), and the bird (similarly coloured) swallowing a fish (red). On the rocks on the other side note the rabbits and fishing reel, and in front of the rabbits the hermit holding the lanthorn (red) wherewith he lighted the saint across the water.

The figure of the hermit is now almost faded away, but the form of it can be distinctly traced.

The greater part of the original picture is red of various shades, a good deal of the background is yellow, and some of the outlines are slate colour.

It will be seen that the picture was formerly of greater height than it now is. It has been much damaged by having had a monument fixed over it.

We cannot too warmly thank Mr. Rollason for the valuable aid afforded. His task was a laborious one that none but an

enthusiast would undertake, and none but a skilled and patient one could carry out.

We take this opportunity of also thanking Mr. F. A. Cozens (Solomon and Company), who endeavoured by spraying varnish over the surface of the painting to preserve it, and who probably could have done so had his aid been sought in time; and the Revd. W. A. Diggins for the constant kindness shown by him to those who have worked at this interesting medieval relic.

A CATALOGUE OF SAINTS CONNECTED WITH CORNWALL,
WITH AN EPITOME OF THEIR LIVES, AND LIST OF
CHURCHES AND CHAPELS DEDICATED TO THEM.

By the Rev. S. BARING-GOULD, M.A.

PART VII. *Si.—W.*

S. SIDWELL OF SATIVOLA, Virgin Martyr.

Sativola is the Latin form of the name Sidwell, presumedly one of the three saintly sisters of S. Paul of Leon, called in his life Sicofola.

According to Leland, who read her legend at Exeter, she was the daughter of one Benna, and was born at Exeter. But from the legend of her sister, Jutwara, we learn that Bana was the name of her brother, and from the Life of S. Paul we ascertain that Porpius Aurelianus was the father's name (*see* S. Paul of Leon). Leland says that she was killed by a *feniseca* (mower), who cut off her head as he coveted her possessions outside Exeter, and she was betrayed into his hands by her mother-in-law (*Itin.* iii, 49). It was this same mother-in-law who contrived the death of Jutwara. The office for S. Sidwell is no longer to be found in the Legendarium of Bishop Grandisson at Exeter.

It is questionable whether Sidwell really was a martyr, and it may be suspected that her canting symbols, a scythe and a well have originated the story that her head was cut off and thrown into a well. S. Sidwell and her sister S. Wulvella are patronesses together of Laneast, where also is their Holy Well, in good condition, whence water is still drawn for baptisms

The parish church of S. Sidwell, by Exeter, is dedicated to her, and here was formerly a Holy Well.

Nansidwell (*i.e.* Llan Sidwell), in Mawnan, may also have been the site of a church under her invocation.

In Bishop Grandisson's Calendar for Exeter, August 2 is given as her day, and this is the day on which her feast was observed at Exeter and at Launceston.

At Laneast the Feast is regulated by that at Altarnun, and falls on the last Sunday in July or the first in August.

Among the additions to an Exeter Calendar of the 12th century in the British Museum, her day is given as August 1, but this is probably a mistake for August 2. Nicholas Roscarrock gives July 31; this agrees with the Altarnun Feast.

S. SILVANUS.

In the *Inquisitio Nonarum* is mention of a chapel of S. Silvanus in Buryan parish. Mr. Borlase thinks Silvanus is the same as S. Levanus. But there is an inscribed stone at St. Just, SELVS HIC JACIT, which may be a contraction of Seollan or Sillan, a name that occurs in Irish Calendars.

S. SITH, Virgin Abbess.

In the centre of the stone camp of Hellsbury, in Michaelstowe Parish, are the ruins of an oblong orientated chapel dedicated to S. Sith. The fragments of cut granite belong to the 15th century.

This formidable position was held by the earls of Cornwall, but before the Norman Conquest, and indeed before the Saxon domination, it must have been a stronghold; and it has the characteristics of an Irish stone camp. S. Sith is but another form for Itha (*which see.*)

Whytford says in his *Martyrologe*, 1526: "The feest of Saynt Dorythy, that by an other name is called also Saynt Sythe, y^t was a grete blode, and whan she sholde have ben maryed unto a gentyle she flede into a monastery of virgyns where y^e deuyll appered unto her, and whan he coude not persuade nor entreate her to leve her purpose he threated her but all she despysynge toke y^e next morowe ye habyte, and was after abesse of holy lyfe, and many myracles. She moche loved Pouerte in so moche y^t whan golde and ryches was offered unto her she cast it from her with disdayne and called for water to washe her handes because she had touched that filthy muck and dungue of the erth."

Her day is January 15.

S. SITHNEY, Abbot, Confessor.

One of the Irish colony. Sithney is the Irish Setna, who was a disciple of S. Senan. The Latin form of his name is Sidonius. In Bishop Stapeldon's Register, 1310--18, the dedication of Sithney Church is to S^{us} Sidninus. In that of Bronescombe (1270) it is to S^{us} Sidnius. In that of Grandisson (1336) the church of S^{us} Sydynny, (1303) S^t Sidnini; in that of Stafford (1403) S^t Sithnini.

Setna was a native of Munster, and had two brothers saints, Govan and Multos. His father's name was Ere, and his mother's was Magna; she was a sister of S. David.

He attached himself very early to Senan, which is not surprising, as David and Senan were intimate and attached friends.

Setna was with Senan when this saint settled on Inis Mor (Deer Island), at the mouth of the Shannon,

One day he caught a woman washing her child's linen in the fountain whence he and all the community drew their drinking water. This was too much for his patience; he flew into a rage and stormed at the woman, using violent language and wishing her all the bad luck he could think of. With him joined his fellow pupil Liberius.

Shortly after the child disappeared, and the mother concluded that the child had fallen over the cliffs into the sea, and further, that this was due to Setna's curses. She rushed to Senan and accused Setna and Liberius of having ill-wished her child and thereby caused its death. Senan was very indignant with his pupils, and ordered Liberius, as the elder of the two, to go and do penance on a rock in the sea, and he bade Setna row him out to this rock, leave him there, and not return without the child's body.

After some hours Setna found the urchin on the beach, paddling in the pools, and he at once conveyed him to the mother. The child had not fallen over the cliff but had strayed, and the woman had rushed to conclusions prematurely and unwarrantably. So Senan bade Setna go after Liberius, and take a lesson not to be intemperate in his language for the future.

Setna must have gone to Kieran of Saighir, for we find that he succeeded him in the abbacy of that place—probably when Kieran left for Cornwall, or temporarily before Carthagh settled there as permanent ecclesiastical head of the Ossorians. It was whilst he was a member of the Community of Saighir that an incident occurred, which, though fabulous, is not without beauty.

He had gone on a visit to S. Molua at Clonfert. They sat talking of heavenly matters, and time flew unnoticed, till Setna started up with an exclamation. The sun was declining, and he feared he could not reach Saighir before it fell dark, and there would be risk in crossing the Shannon after nightfall. Then Molua bowed his head in his hands and prayed. Setna started, and the sun did not set till he had reached his monastery. The distance was between fifteen and twenty miles. The story has been developed out of a very simple occurrence. Setna succeeded in crossing the Shannon before the sun was quite withdrawn, and as the season was Midsummer, there was abundant twilight for the rest of his journey, and he got home without accident.

There are several Setnas in the Irish Calendars. One at Killany in the south is a distinct personage; but it is not so certain that Setna, the disciple of Senan, was not the deaf and dumb boy set to keep cows on Slieve-Bloom, whom S. Colomba of Tir-daglas saw, pitied, blessed, and he recovered hearing and speech; not only so, but also obtained the gift of prophecy.

In the Rawlinson MSS. in the Bodleian Library (B. 512) is a poetical dialogue between S. Findchu and S. Setna, in which the latter foretells the calamities that will befall Ireland. It can not have been composed before 1350; for it fairly correctly gives the succession of events up to that date, after which it goes hopelessly wrong. The conclusion of Setna's story comes to us from Brittany, whither apparently he went, when Carthagh took the rule at Saighir, and he was dismissed.

The life given by Albert de Grand is founded on the lectures for his feast in the Leon Breviary, and on the *Legendarium* of the Church at Folgoat. It is fabricated out of the Life of S. Kieran of Saighir. There was extant no Life of Setna, so the compiler of one for the Breviary deliberately adopted that of S.

Kieran, merely altering the name of the saint. All that portion relative to the life in Ireland is consequently worthless. But so soon as he reaches Brittany, then only we reach ground that is fairly historical. In Brittany he lands at Kerlouan in Léon. Near this he established himself in a cell called thenceforth Peniti-San-Sezni.

Leaving that he went on to Guic-Sezni, where he established a monastery and lived to the age of a hundred and twenty-seven.

Sezni is the Breton form of Sithney, according to the rule that the Welsh *dd* and Cornish *th* becomes *z* in Breton.

The Bretons pretend that so many miracles were wrought by the body of S. Sezni, that the Irish sent a fleet and carried it off. This means no more than that the Bretons did not possess his relics, because he did not die in Armorica. He was buried at Kinsale.

As Setna, the disciple of Senan, and for awhile abbot of Saighir, is not specially commemorated in the Irish Martyrologies, it is probable that there is confusion among several of the same name.

There are, indeed, two Setnas entered on March 9, but they belong to a late period. Another Setna on March 10, and another on January 15, but who they were we do not know.

The feast at Sithney is on August 3. Setna, Sithney, or Sezni is commemorated in Brittany on September 19.

Tresezni, near Lannion, Côtes du Nord, has him as patron, so also Guicsezni now Guisseny in Finisterre.

As Senan died in 554, Setna probably died about 570.

In Art he might be represented with the Sun at his side.

S. STITHIANA, Virgin.

In Bishop Bronescombe's Register, 1268, the patroness of Stythians appears as S^{ta} Stethyana; in that of Quivil, 1282 and 1283, and in that of Bytton, 1308, as S^{ta} Stediana. So also in the Taxation of Nicolas IV. Also in the Register of Stapeldon, 1317, of Grandisson, 1346, 1354 and 1362; and in Stafford's, 1413. But in Grandisson's Register of 1338 as S^{us} Stidianus.

We may conclude that the saint was a female.

According to Hals, the Feast was kept on July 5; it is now observed on July 15, ten days after, *i.e.* on the eve (old style).

July 5 is the Feast of S. Etaine. Edania, or Etain, Virgin of Tumna, in Moylurg, C^o Roscommon. In the Felire of O'Gorman she is described as "fair Edaina, of full and immaculate virginity." The name Stythians is a compound of *Saint* and *Etain*; and as the Feast of Stithiana, and that of Etain are on the same day, their identity may be said to be probable.

She was the sister of S. Illogan (Illadhan) and of S. Derwe (Derchartain).

Both Etaine and her sister were disciples of S. Monynna, whom I have identified with S. Morwenna, and they were associated with Brig, the Breaca of West Cornwall. The rule of Monynna was very severe, and the unfortunate sisters were nearly starved to death. S. Ibar, of Begerry, was appealed to and he remonstrated, and insisted that they should be given a more generous diet. There was, however, a revolt in the community that led to the expulsion of the abbess. Whether Etain and her sister took part in this we do not know.

Etain is sometimes confounded with Modwenna, for the names are really the same. Mo-Etaoin, that is Etain with the affectionate prefix, becomes Modwen by an easy transition. She founded a church and cell at Tumna, or Tuaim-mná "The Tomb of the Women." The ruined church remains romantically situated on the south side of the lower lake of the River Boyle, near where it enters the Shannon. Her Holy Well and grave are shown there.

It was, as I have suggested under Illogan (xiv, 277, *which see*), the outbreak of the Yellow Death in 547 that drove Etain, her sister and brother to Cornwall.

S. SYMPHORIAN, Martyr.

The churches of Forrabury and Veryan are dedicated to Symphorian, martyr, of Autun in Gaul, 180. The ancient name of Veryan was Elerky. S. Symphorian's Day is August 22.

In 1876 the late Rev. John Adams, who had contributed notes on Cornish Saints to the Journals of the Royal Institution

of Cornwall, informed me that he more than suspected that Symphorian had been foisted into these two churches in the place of their original founders, and in the case of Forrabury, he held that the real dedication was to Cynfarch, son of Meirchion Gul.

Cynfarch was married to Nefn, one of the daughters of Brychan, by whom he had Urien Rheged. He dedicated the latter part of his life to religion, and is venerated in Flintshire and Denbighshire. One of his sayings has been preserved :—
“ Whosoever respects not thee, him do not thou respect.”

His day is September 8.

Cynfarch is surnamed Oer, or “ The Cold.” His brother, Llyr Merini, was married to Gwen, another daughter of Brychan, and in some accounts is represented as having been a prince in Cornwall. But that Symphorian replaces Cynfarch is very doubtful.

Forrabury or Boscastle Fair is on November 27.

Veryan is out of the question for Cynfarch.

There was, however, a Saint Cynfarwy, son of Awy ab Llenog, a Cornish Prince. Nothing is known of his acts. It may be observed that Veryan is in the district of foundations by the Domnonian or Cornish Kings.

His day is November 7.

Veryan Feast is on October 1.

Neither the Forrabury nor the Veryan Feast has any reference to S. Symphorian's Day.

It is possible that the Bishops of Exeter, in their efforts to displace local Celtic saints may have taken any name that was approximately near to the name they sought to supplant, when giving to the churches a new patron on their rededication.

S. TATHAN, Abbot, Confessor.

It has been suggested by Mr. Copeland Borlase that Advent is derived from S. Tathan; he writes :—“ Dr. Borlase in MS. notes stated that it was originally S^t Taathan, a name which not

only occurred in old deeds, but had survived to modern times under the form of S^t Tane." The form of the name as given in deeds will be seen by reference to S. Adwen.

There is not sufficient evidence that S. Tathan had a cult in Cornwall to justify a "Life" here. The Latin Life is to be found in Rees "Lives of the Cambro British Saints."

His day is December 26.

S. TEATH, Virgin Abbess.

In the Visitation of 1539, for the taking of an Inventory of Church Goods, St. Teath is given as S. Etha. In like manner S. Ebb has been converted into S. Tebb. (*See S. Itha.*)

S. TELLO, Abbot, Bishop, Confessor.

One of the stalls of the Cathedral Chapter of Truro is named after S. Teilo. This was due to a curious blunder made by Mr. Copeland Borlase, who built up an elaborate structure of argument on very uncertain foundations. He assumed that S. Filius was the same as S. Issey, relying on an error made by Dr. Oliver, that has since been corrected by Prebendary Hingeston Randolph. That done, the whole superstructure falls to the ground. Mr. Borlase not only identified S. Issey with S. Teilo and S. Filius, but also tortured S. Endelienta into Teilo, making her change her sex, a Christian Tiresias.

The only dedication to S. Teilo in Cornwall is a ruined chapel of S. Dillo in Buryan parish.

To give S. Teilo's life and do it justice would require much space, more than is justified for one whose connection with Cornwall is doubtful.

His day is February 9.

His Life is in the *Liber Landavensis*, and in *Vie de S. Thelieu d'après le Livre de Llandaff*, par. J. Loth, Rennes 1894.

S. THEON, Bishop, Confessor.

One of the Scilly group now called Tean was formerly known as S. Teon. In the confirmation of the privileges of the abbey of Tavistock by Pope Celestine III the name is given S^{ta} Theona, Virgo.

In the 10th cent. Litany of British Saints, published by Warren, is Toninnaue. In the Redon Cartulary is mention of a monasterium Sⁱ Toinnaui. In the Calendar of S. Meen he is given on August 2, Touiniaui confessoris.

Lobineau identifies him with Eoghain of Ardstraw, who is the same as the Cornish Euny. He is the patron of Plouha, in Côtes du Nord, where he is called Saint Touin, or Ewine.

The day of Eoghain in Ireland is August 23.

S. THECLA, Virgin.

Mentioned by Leland as one of the company of Breaca, Senan and Maruan. Probably the sister of SS. Germoc (German) and Helan, and a daughter of Coill. She is called Fracla in the Life of S. Gobrian (Akebran). Thecla is either Leland's mistake, or more probably a mistake of the printer of Herne's edition of Leland.

S. TIWENNOC, Abbot, Confessor.

Towednack is called the Chapel of S. Tiwennoc, Confessor, in Bishop Stafford's Register, 1414.

Towednack was a chapelry in the parish of Lelant. A complaint was made in 1409 by the inhabitants, of the difficulty felt by them in attending their parish church, and bulls were obtained from Popes Alexander v, and John xxiii, for the dedication of the dependent chapels of Tiwinoc and S. Ya, to obviate this inconvenience. This was accordingly done on October 9, 1411.*

It has been shown with some plausibility by M. Loth, that Landevennec in Brittany does not mean the church of the Towans or Sandhills, but the *Llan* of the *Ty* of Winnoc, which is a contraction of Winwaloe. This latter point is, however, doubtful, and I am inclined to think that Winoc is Gwenog, the disciple of Winwaloe, *see* Winoc.

* See p. 264 above.

S. TORNEY, Bishop, Confessor.

This saint is also called Ternoe, which is a corruption of Tighernach (the modern form is Tierney), and the Welsh Teyrnog.

His mother's name was Derfraych, and she was daughter of Echach, Prince of Clogher. She loved not wisely but too well, one Coirb, of Leinster, and by him became a mother. Coirb carried off his offspring, a boy, as soon as born, and committed the child to S. Bridget at Kildare, who became to him a foster-mother, and held him at the font, where he was baptised by Bishop Conlaeth. As he came of royal blood she called him Tighernach.

Whilst still a child, he and Eoghain (Euny) were carried off by pirates and sold as slaves in Britain, where they were bought by a petty king, who brought them up with his own sons, and treated them with great kindness, and finally sent them both to Rosnat or Ty Gwyn to be educated by Mancen or Ninio, the abbot. But again pirates came and swept them away, and took them to Brittany, and sold them there to a chief, who set the boys to grind corn in his mill.

In time they effected their escape and returned to Rosnat and schooling. Here Tigernach remained till his monastic education was complete, and then he started on a visit to Rome and Tours. On the way he made fast friends with another Irishman, Kieran, son of Eochaid, who receives no recognition in the Irish Martyrologies, and we know nothing further concerning him than that he and Tighernach travelled together, and together escaped from an inn, where they found that the travellers who were supposed to have money were murdered.

On his return to Ireland he saw Ethnea, daughter of the king of Munster, who was being forcibly carried off to be married to a prince in Britain. She threw herself on the protection of Tighernach, and he intervened, so that she was relieved of being married to a man for whom she did not care, and out of her own land. He gave her the veil, and she started a monastic school.

A petty king, Fiachra, gave Tighernach land on which to settle, whereupon the saint surrounded it with a fosse; and in

return for this donation Fiachra required the saint to curse his enemies and assure him victory in all his warlike undertakings. Tighernach cheerfully complied, and he accompanied the king on his raids. But he was successful in mitigating one of the barbarous customs of the time. After a battle, it was the wont of the victor to cut off the heads of all the enemies who had fallen, and bring them to his camp, where they were piled and counted. By the advice of S. Tighernach, Fiachra was induced to order his "braves" to cut sods of turf in corresponding numbers with the corpses on the field, and stack and count them, and to leave the dead un mutilated. One day Fiachra sent his gillie to get him grass wherewith to line his shoes, and the lad ripped away some from off Tighernaech's land. When the king heard this, he refused the grass, lest the saint should be angry and reproach him with having taken it, and thereby established a claim to take grass as he wanted it from the territory of the saint.

Presently Tighernach departed for Kildare, there to visit his foster-mother, S. Bridget, who forthwith gave orders that he should be consecrated bishop.* When he left, he went on to visit his grandfather, King Eochach, in Fermanagh. The old king at once turned out the bishop of Clogher, whose name was Maenchatin, so as to put his grandson into his seat. This high-handed conduct did not comport with Tighernach's views, and he refused to remain at Clogher, and went to a solitary spot, Clones, in Monaghan. But owing to his appointment to Clogher, he was called "the man of two districts."

One peculiarity of Tighernach is noted. For the admixture with the wine in the Eucharist, he would use no other water than dew or rain.

He died in 548, whilst the Yellow Death was raging in Ireland, but we are expressly told that he did not die of the plague.

The Life of S. Tighernach in the Codex Salamanticiensis is fragmentary. It is a tissue of extravagant fables, but a thread of historical fact can be traced running through the embroidery.

* "Convocatis episcopis eum ad pontificalis ordinis apicem provehi fecit. In hoc enim a clero et a populo totius Hiberniæ erat ipsa beata Brigida privilegiata ut quæcumque ipsa ordinandum judicandum ordinaret, ab omnibus eligeretur."

He is also mentioned in the Life of his friend and companion, S. Eoghain, of Ardstraw.

His residence in Cornwall probably took place before he settled at Clones, and after he had left Ty Gwyn.

The only church founded by him there is Northill.

The day of S. Tighernach in the Irish Calendars is April 4.

In the Aberdeen Breviary on April 5. So also Whytford and the Felire of Gorman. In the Welsh Calendar on this day S. Teyrnog. But the Welsh say he was of the family of Ceredig, and was brother of S. Caranog. These must have been different persons. Or else, what is more probable, the scandalous story of the birth of Tighernach is fable.

In the Leon Breviary his day is October 11.

The revel day at Northill is on the 8th September, or the Sunday after.

In Art he should be represented as a bishop holding two staves (Clones and Clogher) and with a chalice into which a rain-drop is falling.

In Brittany is a S. Thégonnec who seems to have been confounded with Tighernach, but who was a disciple of S. Paul of Leon. His day is September 6.

ST. TUDY, Abbot, Confessor.

In Domesday the parish of St. Tudy is called Eglos-Tudic. In Bishop Bytton's Register it is Ecclesia S^{ti} Tudii; so also in the Taxation of Pope Nicolas iv. In the Registers of Stapeldon, 1308, Grandisson 1348 and 1366, and Stafford 1402, it is the same.

Tudy was possibly Tydecho, in Breton Tudec, son of Gildas, or else Tudwg, son of Tyfodiog; he became a disciple of S. Cennyd, son of Gildas. It is more probable that he is the latter.

He joined himself to S. Mawes, and was with that saint when he was in Cornwall. Afterwards he attached himself to S. Winwaloe.

When S. Winwaloe settled at Landevenec, he achieved the conversion of Grallo, the king. "During the first year of his reign, Grallo exercised his royal authority with a cruel hand; but after he had come to receive instruction from Winwaloe, and had been blessed by him, he became gentler, and governed his kingdom very piously."*

The first result of this was the propagation of Christianity through Armorican Cornouaille, and the foundation of Quimper as a monastic centre. Of this S. Corentine was the first bishop. The Life of this Saint, written in the 13th century, tells us, "Cornouaille not having a bishop required one, and three men of worth and sanctity were chosen, Corentine, Winwaloe, and Tudy; and Grallo sent all three to be consecrated by S. Martin, of Tours, according to Celtic custom to have always three consecrated together. Martin, however, gave the episcopal office to Corentine alone." This story is apocryphal. S. Martin had been dead a century, but it was forged by the Church of Tours for the object of giving a basis to its claims of jurisdiction over the see of Quimper. Nevertheless, there remains an element of truth in it. There were no bishops in Cornouaille at this period, and such as were elected, had to be sent elsewhere to receive the Apostolic commission, but to Tours we may be absolutely certain they were not sent, most probably into Britain.

The story goes on to say that Corentine then gave up his abbatial office to Winwaloe and to Tudy. This also is contrary to fact, and shows how that the writer wrote with a mind biassed by the idea common to Latin ecclesiastics of his period.

The abbot in a Celtic monastery was superior to the bishop, in that he, and not the bishop, exercised jurisdiction.

Winwaloe had founded his establishment himself, and he was supreme therein. Moreover Winwaloe was born about 480, and Corentine was a bishop in 453.

There was a Winwaloe settlement in N. E. Cornwall. Tresmere and Tremaine are Winwaloe churches, Lewanick one of Winwaloe's brother's foundation, so perhaps Jacobstowe. It is therefore not surprising to find one by Winwaloe's disciple Tudy in the district.

* Vita 11da Sti Winwaloi, *ap.* Boll. Acta SS., Martii I.

Tudy died in the latter half of the 6th century.

In Brittany there are churches and chapels to S. Tudy at Landudec (Lann-Tudec), Loc Tudy and Ile Tudy. L'Isle Groix regards him as its patron, for it is held that he died there. The Isle de Groix is off the mouth of the Blavet, about which were settlements of Gildas, and also of Cennyth. So that whether a son of Gildas or a disciple of Cennyth, he was stationed near his father or his old master.

At the Chapel of S. Tudec, near Gourin, on the outskirts of the forest of Toul-Laeron in Spèzet, between Carhaix and Châteauneuf in Finisterre, the *pardon* is on the second Sunday in September. The pilgrims lay their caps filled with rye at the feet of the saint. He is invoked against headache and deafness.*

At Trèdudec (Tref-Tudec) in the Côtes du Nord, S. Tudy has been supplanted by S. Theodore, warrior martyr, whose statue has been erected over the high altar. †

The feast of S. Tudy in Brittany is on May 9.

On this day a fair was granted to be held at S. Tudy in 1705, as also on September 3.

The feast at S. Tudy is now on May 21, *i.e.* Old Style St. Tudy's Day.

S. VEEP, Bishop, Confessor.

Bishop Stapeldon, 1308, Bishop Grandisson, 1349 and 1361, Bishop Stafford, 1400 and 1414, name the church *Ecclesia S^{ti} Vepi*. So also the Taxation of Nicolas IV. Only when Grandisson rededicated the church to SS. Cyriacus and Julita in 1336 did he call it *Ecclesia S^{te} Vepæ*. Brantyngham also makes the same, but again 1394 *S^{ti} Vepi*. The balance is wholly in favour of the saint being male.

Veep is apparently a corruption of Fiech or Fiace who has become in Brittany Ve'ho.

In Brittany the Feast is on June 15, and the Feast at S. Veep is on the Wednesday before Midsummer Day.

* Le Baz : "Annales de Bretagne," T. ix. (1893) p. 46.

† *Ibid* T. xiii., p. 109. There was also formerly a chapel to S. Tudy in Belle Isle and at Le Palais, and there are dedications to him at Poullavouen, Yrèzet, and Plouedern.

S. VORCH, Virgin.

Lanlivery Church, according to Tonkin, is dedicated to S. Vorch, and the name Lanlivery is Lan-le-Vorch.

Ecton in his *Thesaurus Rer. Eccl.*, ed. Browne Willis (3rd ed. 1763) gives S. Brevita as the patroness.

Livery seems to be Vyrehis, the plural of Myrch, Merch, Vereh, a Maiden.

The Feast of Lanlivery is on the first Sunday after the first Tuesday in May.

S. WARNAC, Bishop, Confessor.

A bay in Scilly bears the name of S. Warnac or Warne. Troutbeck, in his "Isles of Scilly," says that he is said by tradition to have been an Irish saint, who came over in a wicker-boat covered with raw hides. Possibly Brynaeh, *which see.* (XIV, 481).

S. WENAPPA, Virgin.

This would be the Latin form of Gwenefwy.

She was a daughter of Caw and sister of Cywyllog, who was the wife of Modred, nephew of King Arthur, and head of the rebellion against him. Her brother was Gildas, so was Howel, whom King Arthur killed in a fit of jealousy. Her nephew, S. Wimmow (Gwynog), son of Gildas, and her great-nephews, Fili and Eval, settled in Cornwall.

Gwennap Feast is on Whit-Sunday.

S. WENEDOC.

See Wethenoc.

S. WENDRON.

The patroness of Gwendron appears in the Episcopal Registers as Wendrona.

Gwendrona in Irish is Findbron, but no such a person is known to the Irish, only a Brontin, sister of S. Ibar of Begerry,

the mother of S. Lithgean (Ludgvan). But whether this Bronfin be Gwendron it is quite impossible to say.

The local tradition relative to S. Wendron is, or was, that she was an Irish woman.

There was a chapel at Tresulla dedicated to the saint, as well as the parish church.

Wendron feast is on the nearest Sunday to October 28.

If we could suppose that Wendron were the Bronfin, mother of S. Ludgvan, then the interesting statue of a woman holding a flowering tree from Ludgvan Church, now in the rectory, might be taken to represent her.

S. WENN, Matr.

There were several of this name, and of names formed from Gwen (White). But the S. Wenn who has given her name to a parish, was most likely Wenn, the wife of Selyf, duke or king of Cornwall, and mother of S. Cuby.

Under the name of S^{te} Candide, a translation of Gwen, she is known in Brittany, and has a Holy Well at Scaër in Finisterre. A good deal of legendary matter attaches to her, but no history of her has been preserved.

The line of foam on the sea formed by the change of the tide is in Brittany called Gwen's Path. The story goes that Saxon pirates made a descent on the Breton coast, and carried off S. Gwen from the islet of S. Cast. They conveyed her to London, but there she tried to throw herself overboard. In the struggle to escape two fingers of the left hand were cut off. However, she escaped, walking on the water, and leaving behind her the white trail of foam ruffled by her sweeping dress.

She was married to a captain and went with him to war against the English (Anglo-Saxons). He was killed. Then she sprang overboard, and when the enemy saw her walking on the water they fled. All her seven sons became bishops.

The statuette of S. Gwen is in the Isle of Cast, Côtes du Nord. It is popularly believed that it is in vain to colour the cheeks of the figure, they at once become white as before. The chapel in the island has fallen into ruins, but the image has been

preserved in a cottage hard by. She is represented with a long staff in her hand. She is invoked by anæmic girls; and the smocks of the sick are dipped in her fountain of the forest of Loudeac, which is in great resort.* There is a parish of S. Gwen in Côtes du Nord. Scaer in Finisterre is dedicated to her, and has her Holy Well.

In Brittany her day is popularly held to be either on October 3 or October 30.

The Feast at St. Wenn is on October 18.

M. de La Borderie thinks that the Gwen commemorated on October 3 is Gwen Teirbron, the mother of S. Winwaloe, but there is much difficulty in deciding which is the Gwen of popular cult.

Dedications to St. Wenn in Devon and Cornwall are:—

The parish church of St. Wenn.

” ” ” ” Morval.

A ruined chapel at S. Kew.

” ” ” at Hartland, (Stafford's Register 1400).

There is a chapel of S. Wenn in Saint Barthélemy, Morbihan.

S. WETHENOC, Abbot, Confessor.

In the Bodmin Calendar a saint of the name of Wethenoc is commemorated on November 7.

According to Bishop Stafford's Register (1415) he had a chapel at Padstow. On the opposite side of the harbour is the church of S. Enodoc. In Bishop Lacy's Register, 16th September, 1434, it is called "Capella S^{ti} Gwinedoci," when the Feast was changed from July 24 to July 13. In an inventory of goods belonging to the chapel 1607—13, it is the chapel of Guenedouce."

His day in Cornwall, as stated above, is November 7.

In Brittany, together with his brother James, November 5.

* Sébilot (P.) *Petite Légende Dorée de la Haute Bretagne*. Nantes, 1897.

S. WILLOW, Hermit, Martyr.

The name of the patron saint of Lanteglos by Fowey. It is so given in an Assize roll for 1284.

William of Worcester, who calls him Vylloc or Wyllow, says that he was of Irish origin, that he lived as a hermit; and was murdered by a kinsman, Mellyn.

After his head was cut off, he rose and carried it from the bridge of S. Willow to Lanteglos Church.

Willow is perhaps Gwyddlew, son of Gwyullyw, king of Glewyseg, and his wife Gwladys daughter, or rather granddaughter, of Brychan, of Brecknock, so that he was Irish only on his mother's side. His brother Glywys was settled on the Fal, and is known as S. Gluvias. He was father of S. Cannen, founder of Llangunten in Brecknockshire. His brother S. Cadoc certainly was in Cornwall for awhile.

The cave in which S. Willow lived is shown on S. Willow's Hill by Lanteglos.

According to William of Worcester, his Feast was kept at Lanteglos on the Thursday before Pentecost.

Nicolas Roscarrock gives as his day June 3.

S. WINNOW, Bishop, Confessor.

This saint is erroneously supposed to be Winnoc, brother or nephew of Juthael, Prince of Armorica, who died about 717, and who was a disciple of S. Bertin in Sithien, and founded Bergues S. Winnoc in French Flanders. This saint had nothing to do with Cornwall and is quite unknown there.

The Cornish Winnow is Gwynnoc or Gwynno, son of Gildas and great grandson of Geraint. Consequently he was uncle of S. Eval and S. Filius, and nephew of S. Wenappa.

He is one of the saints invoked in the 10th century Exeter Litany, published by W. Warren, from the library of the Dean and Chapter of Salisbury, and also in that of S. Vougai. The form there assumed is Guidnou. In the Life of S. Paul of Leon it is latinised into Woednovius. The name has been modernised

in Brittany into Gouzenou. The name is really identical with Gwethenoc, the *th* having become *z* in Breton. But he must not be confounded with Gwethenoc, the brother of S. Winwaloe.

In Bp. Bronescombe's Register, 1269, S^{tus} Wynnocus; so Stalpedon, 1313; Grandisson, 1335, 1348, 1367; S^{tus} Winnocus, Stafford, 1404.

Winnow was committed by his father Gildas to S. Finian to be educated. Finian and Gildas had been much together, and had contracted a friendship that lasted through life.

In the Irish accounts of S. Finian Winnoc figures as Gennoc, as the Welsh *W* was unpronounceable by a Gael, and was turned into *G*. How long Winnoc remained with Finian we do not know, probably only till he had acquired all that this saint could teach him. Then he came into Cornwall, where so many of his family were. It was probably then that he made his foundation on the Fowey. But when the "grandis et verbosa epistola venit e Capreis," the scurrilous letter of Gildas, in which King Constantine and his mother were abused with such indecency, Cornwall was hardly a place where a son of the writer could reside with comfort, and Winnow departed for Brittany.

We may suspect, we cannot be certain, that he rejoined his father at Rhuys, and that he was appointed bishop of Vannes after the fall of the disreputable Macliau in 577, and that he is the Eunius bishop of Vannes mentioned by Gregory of Tours, who was sent to Chilperic by Weroe II, count of Broweroc, on an embassy. Chilperic was highly incensed with the count and sent Eunius into banishment at Augers, where he died 580.

Eunius is a latinisation of Wueno. The *G* was not introduced into names beginning with *W* till the 10th century. He may be the Guenin or Gwennin, bishop of Vannes, commemorated in the Vannes calendars on August 19, although in the lists he is sometimes put before Modestus, who preceded Macliau, and sometimes as later.

S. WINWALOE, Abbot, Confessor.

This remarkable man was son of Fragan or Brychan, cousin of Cado, duke of Cornwall. For some unknown reason Fragan resolved on migrating to Armorica, and he took with him

his wife, Gwen, "of the Three Breasts," daughter of Emyr, of Llydau or Brittany. She had been already married to Æneas Llydewig, and had become the mother of S. Cadfan. With his wife and her two sons by him, Gwethenoc and James, and a small retinue, Fragan disembarked at Brahec, at, we are informed, the eleventh hour of the day, that is to say five o'clock in the afternoon. Then he went through the country seeking a suitable spot where to establish himself. The place at which they came ashore was where a little stream empties into the bay, now called that of S. Briuc. They ascended the stream, found the country unpeopled, and determined to settle where now stands the village of Ploufragan on the Gouet. There the little colony set to work to clear the ground of trees, and to build themselves wattled cabins.

They had not been there long before another party of emigrants from Britain arrived under one Rivold, landing at the mouth of the Gouet. This party advanced up stream, and occupied the country on the right bank.

Gwen of the Three Breasts shortly after gave birth to a son, whom she and her husband named Winwaloe.

In course of time they heard that a British saint of the name of Budoc had a school on the Lauret, one of the islands of the Brehat archipelago, and they sent their three sons to him to be educated.

Before proceeding, it may as well be mentioned that Gwen got her name of Teirbronn, or Three Breasts, because of having married twice, and having a family by the second husband. In like manner Deirinell, the mother of SS. Domangart and Muna, was called the Four Breasted, because she had reared three families—a pair of breasts being allowed only to the first family.

With Budoc Winwaloe remained a good many years, and when he considered himself accomplished in all the learning of the school, at the age of one and twenty, he left.

It is said that one day whilst he was in Lauret, he heard of the work of S. Patrick and his apostolic career, and was filled with a burning desire to go to him and assist in the mission field in Ireland. But in the night S. Patrick appeared and bade him remain in Brittany, as his predestined field of operation was

there. S. Patrick had been dead a good many years before this. Winwaloe's imagination had been fired by the account given him by his master, Budoc, of the work and success of Patrick. Budoc had been brought up himself, if not in Ireland, at all events by Irish monks, and probably in Cornwall. It is absurd, as some Breton historians have done, to take this apparition, or supposed apparition, as fixing the date of Winwaloe's early life in Lauret. We do not know whether he ever had the dream, and, if he had, whether it was exactly as related by the author of his life.

When the young enthusiast woke, he found that his sudden enthusiasm for Ireland had evaporated, and he resolved on remaining in Brittany.

Whilst he was at home, a tame stork flew at Winwaloe's little sister Creirwe, and would have pecked out her eye, had not Winwaloe intervened. This was magnified by the biographer into a marvel. The stork is said to have swallowed the eyeball, but Winwaloe made the bird disgorge, and he replaced the ball, and Creirwe suffered no ill effects from the accident. A writer who could so manipulate a simple incident is not to be trusted when dealing with a dream.

He induced eleven companions to accompany him, and this swarm crossed to the mainland, then turned west, and continued its course till it reached the mouth of the Aulne. There Winwaloe saw an inland sea—

With all its fairy groups
Of islands that together lie,
As quietly as spots of sky,
Among the summer clouds.

He singled out one of these, that bore the peculiar name of Topegig, but now called Tibidi, and resolved on settling in it. The little party at once crossed, built cells on the island, and made a garden.

But the soil was scanty, and the winds from the Atlantic howled and tore over the bare surface of the isle. Nevertheless, the little community clung to it for three years, but the conviction was slowly forming in Winwaloe's mind that the site was undesirable and he would be forced to quit it.

Then occurred a striking incident.

Winwaloe, who was still quite young, was wont to sit on a stony height, with his young disciples round him, where he and they could be sheltered from the sea-winds, consequently with the east and south before him—the mainland rich with woods and pleasant pasture, and with here and there the blue smoke stealing up, and then drifting away, from some little farm.

And as he taught he looked, and saw that it was neap tide. Then on a sudden what had long been simmering in his mind broke into resolution. He started up and bade his pupils follow him in chain, each holding the hand of another, and one with his left hand in his own. So Winwaloe, holding a staff in his right, and with his left conducting this living chain, descended to the beach, and led the way through the shallow water to the mainland.

In the "Life" this has been converted into a miracle, because when the biographer wrote it was no longer possible to wade across. But the whole of this coast has perceptibly sunk into the sea.

Having reached the mainland, Winwaloe proceeded to select a suitable habitation, and chose a spot well sheltered, on which he reared what was afterwards the famous monastery of Landevenec, where the tortuous River Aoun or Châteaulin river falls into the Brest harbour.

"It is a mild and pleasant spot," says the biographer of Winwaloe, "where every year the first flowers open, and where the leaves are last to fall. A place sheltered from every wind save that from the east, a natural garden, enamelled with flowers of every hue."

Inhabitants in the district were sparse, the king was Grallo, a rough and cruel man, but Winwaloe obtained great influence over him and succeeded in somewhat softening his natural coarseness and savagery. The country was covered with timber, and Winwaloe and his young monks constructed their church of felled trees, and with the branches wattled their huts.

Grallo would have given Winwaloe land in many places, for land was not worth much in a country so thinly populated, but the abbot refused the grants, till Landevenec was thoroughly

established, and his pupils properly disciplined. Eventually, when he got the monastery full, and had many docile disciples, chief among whom was the faithful Tudy, who partook of his spirit, he gladly accepted grants, and planted *lams* in all directions.

We are not informed of S. Winwaloe having gone to Cornwall, but it is very probable that he did so, or sent some of his disciples to establish there daughter monasteries, where recruits might be gathered for the parent house. Indeed, so sparse was the population in Brittany that he must necessarily have looked to Britain to supply him with disciples.

His biographer describes him as a man of moderate height, with a bright and smiling countenance; he was very patient and gentle in his dealings with men. He always wore a habit of goatskin. He would never sit down in church, but either stand, kneel, or prostrate himself. He slept on birch-bark fibre, and ate girdle cakes, baked in ashes, or dumplings with vegetables, and a little cheese or fish, but no meat, and his drink was cider. In Lent he took only two good meals in the week.

His death is set down by Lobineau as taking place in 504, but De la Borderie says 532

His mother was sister of Amwn Ddu, Pedredin and Umbrafel; consequently he was first cousin to S. Samson, S. Padarn, and S. Maglorius. Now S. Samson died between 565 and 576, and S. Padarn about 560, S. Maglorius not till 586.

Again: Grallo was king between 489 and 520, according to Dom Plaine, and probably Winwaloe survived him. There is, however, no mention in his life of his having been mixed up with the commotions raised by S. Samson in 555 for the restoration of Judual, so that he may have died before or at that date.

Cadfan, Winwaloe's half brother, considerably older than himself, crossed into Wales from Britain at the beginning of the 6th century—probably about 537, and as Cadfan displayed great activity in Wales, founding churches, he cannot then have been a very old man. Rhiwal is almost certainly the settler who came over shortly after Fragan, Winwaloe's father, and who speedily made himself prince in Domnonia. He was contemporary with King Arthur, and was his cousin. This all leads to the conclusion

that Winwaloe cannot have died so early as 532, and that his death must have taken place nearer to 550.* We shall probably be near the dates in his life if we say that he was born about 470, became a disciple of S. Budoc about 482, and was established at Tibidi not before 500, and that he founded Landevenec in 510, and died 549.

According to his "Life" he died on Wednesday in the first week in Lent, being the third day of March. The expression is ambiguous. One cannot be sure whether Ash Wednesday is meant, or the Wednesday after the first Sunday in Lent. Assuming that the latter is meant, then the year might be 527, 538, 549, assuming Ash Wednesday as Wednesday in first week 555, 560, 566.

The calculation must, of course, be made by the Celtic computation of Easter, as that of Dionisius Exiguus had not been received by the Celtic Church.

The day of S. Winwaloe is March 3. The translation, however, is on April 28.

The Feast at Landewednack in Cornwall is on June 20, but the celebration always begins on the nearest Sunday to that date. The Feast of Gunwalloe is on the last Sunday in April. The Feast at Towednack is on April 28.

Before the Revolution, S. Winwaloe's tomb was shown at Landevenec, but it was destroyed, and the abbey and church are now in ruins.

Dedications to S. Winwaloe are :—

The parish church of Landewednack (Bronescombe, 1279 ; Grandisson, 1310 and 1314.)

The chapel of Gunwalloe. Here there is a Holy Well, which being on the beach and within reach of high tides has become choked with sand. It was customary to clear it on the Feast.

The church of Tremaine.

„ „ Towednack.

„ „ Tresmere.

„ „ Portlemouth, in Devon. Bp. Brantyngham, 18 Oct., 1372, "Ecclesia Sancti Wonewalai de Portlemouthie."

* See further on the date of Winwaloe *under* Wynmol.

In the Inquisition, "Sancti Wynwolay." The saint is represented on the fine screen.

A chapel at Cradock, in S. Clear (Stafford's Reg. 1417.)

In Art he is represented with a crane at his side, and habited as an abbot.

The authority for his Life is the Biography by Wurdistan, written at the end of the 9th century. This exists in its original form, and interpolated with long passages of pious twaddle. It has been published by Père Smidt in "Analecta Bolland," T. vii. This Life is the basis on which all others have been built up.

S. WULVELLA, Virgin, Abbess.

One of the sisters of S. Sidwell, consequently also of S. Paul of Leon. She is patroness of Gulval, which Bishop Grandisson's Register gives as "Ecclesia Stæ Welvelæ de Lanystly" (1328) "Vicaria Sanctæ Welvelæ de Lanistly" (also 1328). In Stafford's Register (1413) "Ecclesia Parochialis Sanctæ Gulvelæ *alias* Wulvelæ de Lanestly." The will of William Bachyler, Sept. 14, 1410, contains a bequest to the church "Sanctæ Golvelæ" (Bp. Stafford's Register, p. 396, H. Randolph). Ecton, in his Thesaurus Rer. Ecl., calls Laneast the Church of Gulwell.

It is therefore idle to claim the church of Gulval as dedicated to S. Gudwell, Bishop.

The parish of S. Paul, the brother of S. Wulvella is separated from that of Gulval by a portion of Madron only. S. Paul must have founded this whilst visiting his sister, before taking ship for Brittany, as already related (*see* S. Paul of Leon). At Gulval was a community of religious women; they would need clerics near them so as to minister to them in holy things, and we may suppose that Paul made his foundation for this purpose, and left some disciples there, but for good reasons did not put his community of young men too near to the house for women.

Bosual, a farm in the parish, was probably, judging by the name, Wulvella's original settlement, Both-Wulvell.

S. Wulvella is not only patroness and foundress of Gulval, but also, conjointly with her sister Sidwell, of Laneast. In a

window of Laneast, she is represented, in stained glass, as an aged abbess, crowned, and with staff and veil.

Gulval Holy Well was at one time greatly resorted to :— Lysons' Cornwall, p. ccii., and Gilbert's History of Cornwall, iii., p. 21. There is also a Holy Well at Laneast. Also a Holy Well and Cross at Ashburton, on the confines of the parish of Staverton (S. Paul.)

The Feast at Gulval is observed on the Sunday nearest to November 12 ; and Ashburton feast is on the Tuesday or Thursday nearest that day.

S. WYMP, Virgin, Abbess *see* Wenappa.

S. WYNER, Martyr.

The same as S. Fingar or Gwynear. In Bp. Stapeldon's Register, 1319, Gwynear is called "Ecclesia Sⁱ Wyneri." Leland gives the name as Wymer.

S. WYNNOL, Abbot, Confessor.

Called in Brittany Gwenaël, was the successor of S. Winwaloe in the abbacy of Landevenec.

He was son of a Briton named Romelius, and his mother's name was Lætitia, or in Breton Lavenez : they had migrated to Armorica. One day, when S. Winwaloe was visiting King Grallo, he passed a number of boys at play. One of these, on seeing him, left his game, and ran to the abbot, knelt at his feet, and begged to be admitted into his community.

Winwaloe looked into his fresh face, blessed him, and bade him return to his companions and to his sports. But the child would not be thus put off. When Winwaloe went on his way, he saw that the boy followed at a distance. He turned, and said, "My son, go home, my way is long, and arduous and rough." "Then I will tread in your steps," promptly answered the lad.

As his parents raised no objection, Winwaloe took the young aspirant after monastic perfection with him to Landevenec, on his return from the visit to Grallo.

Wynnol was for forty-three years under the rule of Winwaloe, till the death of that saint, and then, by the special desire of Winwaloe, as he lay on his death-bed, Wynnol was chosen as his successor. He retained the rule over Landevenec for seven years, and then, desiring to visit the establishments in Britain, he took with him eleven of his monks, and they spent four years in the monasteries of Britain, doubtless those founded by S. Winwaloe as feeders to Landevenec.

On his return he resumed the abbacy but retained it for three more years only, when the craving came on him for a solitary life. He took with him three brethren and went into the territory of Vannes, where he found a lonely spot in a wood near a copious fountain.

One day when Weroc, the count, was hunting, the doe he pursued took refuge under the habit of the saint in his cell. Weroc spoke kindly to him, and promised that he would leave him unmolested in his solitude.

At the end of nine months, hearing that some quarrel had broken out in Landevenec, Wynnol returned to the monastery to set matters to rights. There he remained till his death, which took place four years later.

The Life of S. Guenael or Wynnol is important as giving us some clue to the date of S. Winwaloe.

Wynnol was a boy when Winwaloe was on a visit to Grallo 480-520. Let us say that Wynnol was taken into the family at Landevenec in 489. He received the habit in 492, became abbot in 532. He visited Britain in 543, and returned in 546. He went into Vannes district into retirement, where he met Weroc, afterwards Count of Vannes, who died 594. Wynnol himself died in or about 574.

S. Guenael's or Wynnol's Day is November 3.

The only trace of his labours in Cornwall is the chapel of S. Winolls, in S. Germans.

Dedications to him, however, in Brittany are numerous. At Ergue-Gaberic, Plou-Gouvelin, Bolazec, and Landivisiau in the department of Finistère. He is there known as S. Guinel.

* Gwerch or Weroc II. was from 577 to 594 about.

At Treguidel, in Côtes du Nord, is an interesting statue of him in the chapel of S. Pabu.

He had chapels at Bourbry, Carnac, Caudan, Cleguer, and in the Isle de Groix, where it is held that he died; at Quiscriff, Languidic and Lescoet, in Morbihan.

He had a chapel at Plouvigner, a priory at Vannes, and another at Saint Tugdual. He had chapels also in Wales.

His aid is invoked in rheumatic complaints.

The water of his Holy Well at Pouldergat, in Finistère, is drunk, and patients are bathed in it.

His *pardons* are on the Monday in Whitsun week, and on the last Sundays in August and November.

In Art he would be represented as an abbot with a doe at his side.

His name is variously given. In the Cartulary of Landevenec he is called Wenhael. Guenael means "The White Angel."

The authority for his Life is a "Life" written about 818, published by Menardus in his Martyrology, 1629. Also the lections in the Breviaries of Quimper, Vannes, and Landevenec, on which Albert Le Grand has based his "Life."

NOTE.—The lives of St. Paul of Leon, and others, that should have appeared in this number, will be printed in the next journal and complete the series.

COMPARISON OF RAINFALL IN THE NEIGHBOURHOOD.

1905.	J. C. DAUBUZ, Esq., Killow.				W. J. LEAN, Esq., Truro Water Works.				H. TRESAWNA, Esq., Lamellyn, Probus.				GEO. PENROSE, Royal Institution of Cornwall.									
	Total depth, in 24 hours.		Greatest fall in 24 hours.		No. of days on which 'or more fell.		Inches		Total depth.		Greatest fall in 24 hours.		No. of days on which 'or more fell.		Inches		Total depth.		Greatest fall in 24 hours.		No. of days on which 'or more fell.	
	Inches	Depth	Date	No. of days	Inches	Depth	Date	No. of days	Inches	Depth	Date	No. of days	Inches	Depth	Date	No. of days	Inches	Depth	Date	No. of days		
January ...	2.93	.71	15	16	3.03	.84	15	10	2.75	.80	15	11	2.94	.66	16	16	2.94	.66	16	16		
February ...	1.64	.59	25	15	1.00	.55	26	6	1.38	.39	25	13	1.48	.45	25	17	1.48	.45	25	17		
March ...	6.30	1.55	10	21	5.60	1.15	10	15	5.03	.83	10	19	5.82	1.18	10	21	5.82	1.18	10	21		
April ...	3.00	.53	10	16	3.44	1.16	16	11	3.05	.74	15	15	3.03	.72	15	18	3.03	.72	15	18		
May ...	.58	.41	1	5	.58	.35	1	4	.71	.35	1	3	.58	.36	1	4	.58	.36	1	4	
June ...	2.52	.52	12	18	2.38	.55	29	15	2.41	.57	16	14	2.35	.56	29	18	2.35	.56	29	18		
July ...	.49	.34	10	6	.49	.36	9	8	.50	.26	9	5	.52	.36	9	6	.52	.36	9	6	
August ...	4.46	.77	24	19	4.68	1.30	27	19	4.66	.80	2	18	4.60	.81	24	18	4.60	.81	24	18		
September	1.48	.50	9	11	1.11	.38	10	12	1.06	.40	9	10	1.32	.40	9	17	1.32	.40	9	17		
October ...	3.26	1.39	31	16	2.69	1.37	31	13	2.07	.70	31	13	3.28	1.34	31	16	3.28	1.34	31	16		
November	6.01	.72	25	22	5.91	.90	26	20	5.59	.65	13	19	6.14	.87	12	22	6.14	.87	12	22		
December ...	2.42	.48	30	17	2.05	.67	31	15	1.99	.42	30	12	2.02	.51	30	15	2.02	.51	30	15		
TOTAL ...	35.09			182	32.96			148	31.23			152	34.08			188	34.08			188		

SUMMARY OF METEOROLOGICAL OBSERVATIONS AT TREWIRGIE, REDRUTH.

Latitude 50° 13' 44" N.

By ARTHUR P. JENKIN, Esq.

Longitude 5° 13' 48" W

1905. Month.	MASON'S HYGROMETER.				THERMOMETER ABSOLUTE.						RAINFALL.			CLOUD.			WIND.			REMARKS.								
	Mean of Dry Bulb.	Mean of Wet Bulb.	Wet Ther. below dry.	Mean Dew Point.	Relative humidity.	Maximum.	Day.	Minimum.	Day.	Range.	Mean of all the Maxima.	Mean of all the Minima.	Approximate mean temperature.	Monthly mean range.	Total depth.	Number of rainy days.	Greatest fall in 24 hours.	Date.	Mean amount at 9 a.m.		Relative Proportion of.	N.	S.	E.	W.			
																										Mean amount at 9 a.m.	Relative Proportion of.	N.	S.	E.	W.
January ...	42.7	40.7	2.0	38.3	84	51.2	7	31.3	27	19.9	46.3	38.8	42.6	7.5	2.46	17	0.63	16	7.8	24	36	22	38					Gale, 6, 14. Hail, 9, 17. Snow, 17. Hoar Frost, 19, 26, 27.
February	43.3	41.2	2.1	38.7	84	52.3	18	29.5	23	22.8	46.9	39.4	43.2	7.5	1.51	21	1.60	25	7.6	33	14	11	54					Gale, 19, 25. Fog, 7, 8, 18, 24. Snow, 29, 26. Hail, 29, 26, 27, 28.
March ..	46.0	44.1	1.9	41.9	86	56.6	21	31.3	3	25.3	50.4	40.2	45.3	10.1	6.45	22	1.30	10	7.2	10	32	17	65					Gale, 5, 10, 14. Hail, 1, 9, 11, 12. Thunder and Lightning, 11, 14, 15. Fog, 3.
April ...	47.8	45.6	2.2	43.2	84	57.6	13	34.0	19	23.6	51.9	42.7	47.3	9.2	3.23	19	0.62	10	7.8	34	34	19	33					Gale, 13, 15, 29. Hail, 18. Snow, 18.
May ..	53.2	49.0	4.2	44.8	73	66.4	17	37.5	23	28.9	57.9	43.9	50.9	14.0	0.07	7	0.49	1	5.5	46	19	26	33					Gale, 1. Fog, 6, 7, 27.
June ...	58.9	55.6	3.3	52.6	80	72.1	25	46.0	7	26.1	63.1	51.5	57.3	11.6	2.49	19	0.69	12	6.8	33	32	32	23					Thunder & Lightning, 11. Fog, 13, 29.
July ..	63.6	60.2	3.4	57.3	80	76.3	9	49.1	7	27.2	67.4	56.0	61.7	11.4	1.37	15	0.50	1	6.8	43	22	9	50					
August ...	60.6	57.1	3.5	54.0	78	71.1	16	47.9	14	23.2	64.6	52.8	58.7	11.8	5.91	22	1.14	24	6.6	31	28	11	54					Gale, 2, 3.
September	56.0	53.4	2.6	51.1	83	67.7	5	43.0	21	24.7	60.3	49.6	55.0	10.7	1.59	16	0.50	9	7.0	37	18	32	33					Fog, 2, 3, 4, 5.
October ...	48.8	46.1	2.7	43.2	81	59.5	10	32.5	21	27.0	53.0	42.5	47.7	10.5	2.84	18	0.90	31	6.8	49	11	32	28					Gale, 4. Fog, 9, 10. Hoar Frost, 17, 29, 21, 22, 24, 29. Solar Halo, 27.
November	44.1	42.4	1.7	40.3	87	53.1	2, 10	30.1	21	23.0	48.4	38.9	43.7	9.5	6.19	25	0.82	12	6.0	23	26	24	47					Gale, 25, 26, 27. Lightning, 7. Snow, 18. Hoar Frost, 21. Hail, 27.
December	44.1	43.2	0.9	42.1	93	52.3	7	33.8	4	18.5	47.6	40.5	44.0	7.1	2.87	24	0.67	30	7.2	11	53	22	38					Gale, 39, 31. Fog, 7, 8, 13, 14, 15, 16, 28. Hail, 9, 19. Hoar Frost, 11, 13.
Means	50.8	48.2	2.6	45.6	82	61.4		37.2		24.2	54.8	44.7	49.8	10.1	37.58	225	*		6.9	31	27	21	41					

Totals*

Readings taken at 9 a.m. local time. All instruments with Kew Certificates, and where applicable are placed in a Stevenson Screen, Ordnance Bench Mark, 388 feet. Wind is calculated as follows:—N=N.4 N. W. =2 N. 2. W. W. =1 W. S.W. =2 S. 2. W. W. S.W. =3 W. 1 S. and so forth. Height above sea levelled from

Summary of Meteorological Observations at Truro, in Lat. 50° 17' N., Long. 5° 4' W., for the year 1905, from Registers kept at the Royal Institution of Cornwall, by the Curator, Mr. Geo. Penrose.

1905.	MONTHLY MEANS OF THE BAROMETER. Cistern 43 feet above mean sea level.													Days in which it occurred.					
	Month.	Mean pressure corrected to 32 deg. Fahr. at sea level.			True mean of monthly means.	Mean force of vapour.	Mean pressure of dry air.	Corrected absolute maximum observed.		Corrected absolute minimum observed.		Day.	Extreme range for the month.		Mean diurnal range.	Greatest range from 9 a.m. to 9 p.m.	Day.	Greatest range in any 24 consecutive hours.	Between which days it occurred.
		ins.	3 p.m.	9 p.m.				ins.	ins.	ins.	ins.								
January	30.337	30.316	30.316	30.323	30.319	2.43	30.080	31.061	28	29.060	16	2.001	.118	.33	9	.62	17 & 18		
February	30.298	30.275	30.280	30.284	30.281	.254	30.030	30.338	15	29.246	26	1.392	.074	.20	25	.75	25 & 26		
March ...	29.764	29.764	29.758	29.762	29.755	.275	29.487	30.363	3	28.880	15	1.483	.129	.37	13	.60	1 & 2		
April ...	29.875	29.864	29.878	29.872	29.868	.264	29.608	30.350	1	29.141	30	1.299	.084	.36	11	.54	27 & 28		
May	30.172	30.168	30.164	30.168	30.165	.323	29.845	30.470	9	29.244	1	1.225	.059	.28	2	.39	1 & 2		
June	29.963	29.964	29.967	29.964	29.963	.421	29.543	30.399	22	29.615	29	0.784	.050	.13	19	.21	27 & 28		
July	30.110	30.103	30.120	30.111	30.109	.541	29.570	30.293	14	29.838	1	0.355	.041	.09	9	.21	1 & 2		
August ...	29.920	29.922	29.940	29.927	29.923	.407	29.520	30.358	12	29.293	4	1.065	.102	.30	5	.42	29 & 30		
September	30.018	30.008	30.014	30.013	30.009	.389	29.624	30.351	1	29.569	7	0.782	.063	.14	11	.28	7 & 8		
October	30.128	30.113	30.115	30.118	30.112	.286	29.832	30.494	9	29.210	30	1.284	.067	.23	28	.46	5 & 6		
November	29.743	29.727	29.706	29.725	29.721	.255	29.470	30.291	21	29.067	13	1.134	.122	.54	12	.72	1 & 2		
December	30.233	30.206	30.206	30.215	30.212	.275	29.940	30.860	12	29.264	28	1.596	.084	.28	26	.58	9 & 10		
Means ...	30.046	30.036	30.038	30.041	30.036	.327	29.712	30.486		29.294		1.192	.082	.27		0.48			

REMARKS.—The Barometer used is a Standard, made by Barrow, and compared with the Standard Barometer at the Royal Observatory, Greenwich, by Mr. Glaisher. The corrections for Index Error (+0.008), Capillarity (+0.103), height above sea (43 feet), and temperature, have been applied.

TABLE No. 2.

1905.	MONTHLY MEANS OF THE THERMOMETER.												MASON'S HYGROMETER.						SELF REGISTERING.						ABSOLUTE.			
	9 a.m.		3 p.m.		9 p.m.		Mean of Dry Bulb.	Mean of Wet Bulb.	Mean correction for diurnal range.	Mean temp. of evaporation.	Wet Therm. below dry.	Mean dew point.	Dew point below Dry Therm.	Mean of all the Maxima.	Mean of all the Minima.	Approximate mean temp.	Correction for the month.	Adopted mean temp.	Daily mean range.	Maximum.	Day.	Minimum.	Day.	Range.				
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.																			Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.
January	44.0	42.3	46.6	44.1	42.7	41.1	44.4	0.4	44.0	42.5	0.0	42.2	1.8	39.6	4.4	49.0	37.2	43.1	0.1	43.0	11.8	55.0	8	25.0	27	30.0		
February	45.9	44.2	47.7	45.1	43.9	42.1	45.8	0.7	45.1	43.8	0.5	43.3	1.8	40.7	4.4	50.4	39.9	45.1	0.1	45.0	10.5	56.0	16	29.0	25	27.0		
March ...	48.0	46.1	50.6	48.2	45.8	44.8	48.1	1.0	47.1	46.3	0.6	45.7	1.4	42.8	4.3	53.3	39.8	46.6	0.2	46.4	13.4	60.0	21	27.0	3	33.0		
April ...	50.5	47.4	52.3	48.5	47.3	45.5	50.0	1.6	48.4	47.1	1.3	45.8	2.6	41.7	6.7	55.4	42.8	49.1	0.1	49.0	12.5	63.0	27	34.0	7	29.0		
May	56.8	51.8	60.0	54.6	50.4	49.4	55.7	2.3	53.4	51.9	1.4	50.5	2.9	47.0	6.4	63.1	42.1	52.6	0.8	51.8	20.9	74.5	18	34.0	23	40.5		
June	62.3	58.2	64.0	60.1	56.8	55.9	61.0	2.9	58.1	58.0	1.7	56.3	1.8	54.2	3.9	67.2	51.7	59.9	0.3	59.6	15.5	82.0	25	42.0	14	40.0		
July	67.3	62.7	69.5	64.1	61.1	60.1	65.9	2.1	63.8	62.3	1.2	62.1	1.7	61.2	2.6	72.9	55.5	64.2	0.3	63.9	17.4	83.0	26	44.0	7	39.0		
August ...	63.0	58.3	64.6	59.1	57.3	55.4	61.6	2.0	59.6	57.6	1.2	56.4	3.2	53.3	6.3	68.0	52.1	60.0	0.3	59.7	15.8	77.0	14	41.0	14	36.0		
September	58.9	55.6	61.0	56.9	54.1	52.9	58.0	1.7	56.3	55.1	0.9	54.2	2.1	52.1	4.2	64.1	49.2	56.7	0.2	56.5	14.9	73.5	5	37.5	15	36.0		
October	48.7	46.5	53.7	50.4	46.1	44.8	49.5	0.8	48.7	47.2	0.6	46.6	2.1	43.8	4.9	56.5	39.0	47.7	0.4	47.3	17.4	67.2	10	24.0	26	43.2		
November	43.9	42.7	48.5	46.8	41.0	40.2	44.4	0.6	43.8	43.2	0.5	42.7	1.1	40.8	3.0	50.9	34.9	42.9	0.1	42.8	15.9	57.0	2	21.0	21	36.0		
December	45.7	44.5	48.0	46.5	44.6	43.8	46.0	0.2	45.8	44.9	0.3	44.6	1.2	42.8	3.0	49.9	39.6	44.7	0.2	44.5	10.2	55.5	7	27.0	12	28.5		
Means	52.9	50.0	55.5	52.0	49.2	48.0	52.5	1.3	51.1	49.9	0.9	49.2	1.9	46.6	4.5	58.4	43.6	51.0	0.3	50.8	14.6	66.9		32.1		34.9		

The Thermometers are placed on the leaded roof of the Royal Institution in a wooden shed, through which the air passes freely. The Standard wet and Dry Bulbs are by Negretti and Zambra, with Kew Certificates

TABLE No. 3.

1905.		WINDS.												AVERAGE FORCE.														
		E.			S.E.			S.			S.W.			W.			N.W.			N.			N.E.			9 am.	3 p.m.	9 pm.	Mean.
Month.		ave	p.m.	wd	ave	p.m.	wd	ave	p.m.	wd	ave	p.m.	wd	ave	p.m.	wd	ave	p.m.	wd	ave	p.m.	wd	9 am.	3 p.m.	9 pm.	Mean.		
January	0	2	1	10	8	5	0	1	2	0	0	1	3	4	3	11	14	7	0	0	2	1	1	0	28	32	22	27
February	0	0	0	3	4	0	0	0	2	3	1	2	7	6	5	7	13	4	4	1	3	3	3	2	33	34	20	29
March ...	1	1	0	6	5	1	1	0	1	6	10	10	9	6	3	5	6	3	2	1	4	0	1	0	35	40	25	33
April ...	2	1	2	6	5	4	3	2	2	4	1	4	1	5	6	8	7	2	3	3	2	3	4	2	37	38	19	31
May ...	4	2	0	7	7	2	2	3	5	2	2	2	0	0	2	7	9	3	7	7	4	2	0	1	27	31	08	22
June	3	2	2	9	10	4	1	0	4	5	3	0	1	4	3	7	5	3	3	4	5	1	1	0	27	29	14	23
July	2	2	1	4	2	1	0	0	0	7	4	5	4	8	8	9	11	10	5	4	0	0	0	0	29	31	14	24
August ...	0	0	0	6	7	5	3	3	2	5	3	5	8	3	2	5	11	6	3	1	0	0	1	1	33	32	20	28
September	7	6	3	0	1	1	1	0	0	4	4	5	2	2	4	9	12	3	6	3	4	1	2	1	34	36	21	30
October ...	4	6	3	0	0	0	0	0	0	3	1	3	1	3	3	9	9	8	6	8	4	3	2	1	28	32	18	26
November	0	0	0	2	3	0	5	4	2	0	1	2	1	4	4	5	9	5	6	4	4	5	5	4	27	36	20	27
December	0	0	0	14	16	15	1	0	0	1	2	3	2	1	1	4	0	0	6	7	1	0	0	0	26	32	21	26
Total ...	23	22	12	67	68	38	17	13	23	40	32	42	39	46	44	86	110	54	51	43	33	19	20	12	364	403	222	326
Means ...				57.6			17.6			38.0			43.0			83.3			42.3			17.0			30	33	18	27

The force of the Wind is estimated on a scale from 0 to 12, from calm to violent storm

TABLE No. 4.

1905.	WEATHER.																	
	Month.	AVERAGE CLOUDINESS.			RAINFALL.			Mean weight of vapour in a cubic foot of air.	Mean additional weight required for saturation of the air.	Mean humidity of atmosphere.	Mean elastic force of vapour.	Mean weight in grams of a cubic foot of air.	Total hours of Bright Sunshine.	No of Days on which the sun shone.	Average Daily sunshine.	Dry.	Wet.	REMARKS.
		9 a.m.	3 p.m.	9 p.m.	Mean.	Truro.	No. of days on which rain fell.												Rainfall in inches.	Greatest fall in 24 hours.	Truro.	Depth.	Date.
January	6.4	6.7	5.6	6.2	2.94	16	2.94	.66	16	16	16	58.5	18	1.9	80	13	Gale, 6, 14. Fog, 7, 18, 19, 24, 25, 26, 27, 28. Hail, 9. Sleet, 17, 30. Frost, 19, 24, 26, 27, 28.	
February	6.1	6.3	6.2	6.2	1.48	17	1.48	.45	25	17	17	75.2	23	2.7	73	11	Gale, 19, 20, 27. Fog, 7, 8, 10. Hail, 19, 26, 27, 28. Frost, 25.	
March	5.9	5.9	5.2	5.6	5.82	21	5.82	1.18	10	21	21	140.9	29	4.5	72	21	Gale, 11, 12, 14. Fog, 3, 4. Hail, 8, 9, 11, 12. Frost, 3, 4. Thunder and Lightning, 14.	
April	7.4	7.5	6.4	7.1	3.03	18	3.03	.73	15	18	18	126.9	29	4.2	73	17	Gale, 15, 30. Fog, 9, 11.	
May	3.9	3.2	2.1	3.0	0.58	4	0.58	.36	1	4	4	251.2	30	8.1	87	6	Gale, 1. Fog, 7.	
June	5.8	5.8	5.5	5.7	2.35	18	2.35	.56	29	18	18	179.2	26	5.9	78	12	Thunder and Lightning, 11.	
July	5.2	5.3	4.1	4.8	0.52	6	0.52	.36	9	6	6	220.7	30	7.1	90	3		
August	5.2	6.4	4.4	5.3	4.60	18	4.60	.81	24	18	18	201.6	30	6.6	81	12	Gale, 3, 4. Lunar Halo, 14.	
September	4.8	4.9	4.0	4.5	1.32	17	1.32	.40	9	17	17	169.5	30	5.6	81	9	Gale, 7, 8. Fog, 26. Lightning, 7.	
October	5.4	6.0	4.8	5.4	3.28	16	3.28	1.34	31	16	16	124.4	26	4.0	77	16	Gale, 4. Fog, 17, 21, 23, 24, 26, 28. Frost, 21, 22, 23, 24, 25, 26, 28.	
November	4.0	5.3	4.4	4.5	6.14	22	6.14	.87	12	22	22	92.6	21	3.0	70	20	Gale, 13, 26. Fog, 4, 7, 9, 20, 21, 24, 29. Hail, 6. Frost, 3, 4, 7, 9, 16, 17, 18, 20, 21, 22, 23, 25.	
December	6.8	7.2	6.0	6.6	2.02	15	2.02	.51	30	15	15	47.6	14	1.5	85	8	Gale, 31. Fog, 1, 2, 4, 8, 10, 11, 12, 13, 14, 16. Hail, 19. Frost, 10, 11, 12.	
Means	5.5	5.8	4.9	5.4	34.08	188*	34.08			3.7	3.7	525.8	300*	4.6	78	12		

* Totals

Cloudiness is estimated by dividing the sky into ten parts, and noting how many of these are obscured. The sunshine is taken by a Jordan's Photographic Sunshine Recorder presented by J. D. Enys, Esq., F.R.S. The rain gauge is placed on the flat roof of the Royal Institution, at about 40 feet from the ground.

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No. 4.	1899, Oct. 5.	Nov. 21.	Mr. Rupert Vallentin.	Ichthyology.
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