

## Science Notes.

### THE LABOUR OF RATS.

THE labour of rats is successfully utilised in the United States, where they have been introduced into cotton-mills as a labour-saving device. For many years it has puzzled the manufacturers of raw cotton for the market to find a means of extracting the seeds from the cotton successfully, and although many expensive machines have been made and used, it has been found the fibre of the cotton was too often injured in the process. Recently a genius discovered that rats like the seeds, and will pull the largest bundle of cotton to pieces to get them. They do better work than any machine and do not injure the fibre in the least. The labour of rats is successfully utilised by ivory workers in London. Many of the elephants' tusks are observed to have their surfaces grooved into small furrows. This is done by rats, which are fond of the gelatine or animal glue in the substance. The ivory-cutter selects for his purpose by preference those tusks which have been gnawed in this way, because they contain the most gelatine and are best in material.

### THE WATER-FINDERS.

Lord Burton, writing to a contemporary, says: "I venture to trouble you with a short account of my own experience of water-finders and their methods. We are situated in Needwood Forest, on the top of a mass of marl thrust up between the rivers Dove and Trent. Our water is derived from wells averaging from 140ft. to 180 ft. deep, and owing to a series of dry years our supply has recently been very scanty. Our best well gives about 4000 gallons in the 24 hours. About three months ago I sent for Mr. Mullins, the well known water-finder, who walked around the property with a small hazel wand or twig in his hands. Every now and then the wand seemed to twitch, and he indicated that water would be found in these places, naming an approximate depth and probable supply. At last we came to a field where the twig gave indications of a row of springs, and Mullins informed us that if we sank we should probably get a supply of nearly 40,000 gallons in the 24 hours. We have sunk, and at 140ft. to 150ft. we have a most abundant supply, quite equal to what was promised, and we expect to get more by driving adits right and left. One curious thing was that when the twig was placed in another person's hands the twig slowly turned up; but this happened only with two out of four persons experimented on. I cannot explain the phenomenon, but it appears to me to be perfectly genuine, and certainly in my case the result has been very successful."

### A POCKET LAMP.

Not very many men carry lamps in their pockets, but there is at least one man who does, and that is the lamp-lighter on the New York elevated road. It is an alcohol lamp, like a section of brass cylinder, five or six inches long and an inch through, holding the wick, projecting at one end. The lamp-lighter comes in at the front door of the car with his lamp lighted. With a rapid ease, acquired by experience, he lights the six lamps, seeming almost not to pause in his progress through the car. If he is in the last car, as he pulls down the chimney over the last lamp he has lighted and turns toward the rear-door he blows out his lamp and drops it in his pocket. His hands are now free. He throws back the door, walks out upon the platform, opens the gate and steps off upon the station platform or down upon the other side, ready to board the next train. A touch of a match will ignite the alcohol lamp.

## A GLANCE AT THE PENAL LAWS IN IRELAND.

WHEN that royal profligate, Henry VIII, finally relinshed that the Pope would never permit him to put away Katharine of Arragon, his only thought was to contest the Papal authority. There is no good reason to believe that he contemplated either the destruction of Catholic worship or (except on the points involved in the repudiation of Katherine) the suppression of Catholic doctrine. All this was an after-thought. The seizure of monasteries, the breaking of altar-stones, the hot persecution of "massing priests," formed no part of Henry's original policy. The crucial point was the Papal supremacy. "Hold on to your Mass and your confession, if you will," said the King in effect; "only acknowledge me pope of the English Church." That infamous system of minute persecution, known in its perfection as the penal laws, was originally a very simple thing; it consisted only in the acknowledgment of the spiritual supremacy of the King, and the denial of the right of appeal to Rome. It is a fact too often overlooked by popular writers and speakers that all the evils that befell the Irish people after the "Reformation" befell them simply because of their loyalty to Rome. Well, indeed, do they deserve the title of "the Pope's Irish," which was bestowed on them in derision by their enemies; but which is no longer—thank God!—a badge of ignominy nor a term of reproach.

The instrument chosen by Henry to spread in Ireland "the gospel light that first dawned on Boleyn's eyes" was an apostate monk named Brown. Him Henry appointed to the see of Dublin, charging him with the task of reducing the Irish to the King's obedience. The task, it appears, was not an easy one; for in answer to the royal threat that "another of more virtue and honesty" would be put in his place unless his efforts were attended with better success, Brown replied that he "had endeavoured at the danger and hazard of his temporal life to procure the nobility and gentry of this nation to due obedience in owning of his Highness their Supreme Head as well in spiritual as in temporal, and did find much oppugning therein. . . . The common people of this island are more zealous in their blindness than the saints and martyrs were in truth at the beginning of the Gospel."

Brown urged the King to invoke the assistance of legislation; and, accordingly, the Parliament met on the 1st of May, 1537, and enacted the famous Act of Supremacy and Act of Appeals, which read as follows:

V. The King, his heirs and successors, kings of England and lords of Ireland, shall be accepted and reputed the only Supreme Head on earth of the whole Church of Ireland.

VI. No one shall pursue of execute any appeal to or from the Bishop of Rome, or to or from any other that claim authority by reason of the same, for any case or cause whatsoever; the offenders, their aiders, counsellors, and abettors, incurring the penalty of imprisonment.

It is plainly impossible, in a single essay, to quote in detail the penal legislation of so many reigns; the most we can do is to summarise briefly the points on which that legislation touched. It was soon made a treasonable act to maintain the Papal supremacy "by writing, preaching, teaching, or any other a t." Bishops were enjoined to search out persons suspected of transgressing this law; every officer of the kingdom, lay and ecclesiastical, everyone assuming Holy Orders or taking a degree in the University, was required to denounce the Pope; and those who refused to do so were to be punished by death.

The next act of the austere and virtuous Henry was to suppress a dozen monasteries, reserving to himself not only the property, but likewise the "ornaments, jewels, goods and chattels belonging thereto"; and promising, of his most excellent charity that the religious would have leave to retire to any other monastery "where good religion is observed, there to live religiously during their lives." This feature of the persecution proving profitable, it was adopted with so much enthusiasm that "there was not a monastery from Aran of the Saints to the Iccian Sea that was not broken and scattered except only a few."

During the reign of Edward VI. there was practically no new penal legislation. Even the order substituting the English Book of Common Prayer for the Latin Liturgy became almost a dead letter. Under Philip and Mary, the pre-Reformation status was virtually restored, and the dignity and authority of the Holy See were protected by legal enactment. Mary even went so far as to punish and repress all heretics and Lollards and their damnable sects, opinions and errors"; and Philip, King of Spain, made munificent provision abroad for the education of Irish priests, who were to return to their own country after receiving Holy Orders. Thus the seminaries of Compostella and Salamanca were the fortunate effects of anti-Catholic legislation in Ireland.

Elizabeth, however, ascended the throne in 1558, and soon manifested her intention to undo the work of the previous reign. The old penal laws were again put in force, and the Protestant ritual enjoined under new penalties. All clergymen refusing to use the "Book of Common Prayer" in public devotions were fined and after the third offence imprisoned for life. The laity who absented themselves from the heretical conventicles where it was used were fined twelvenpence for each transgression. How rigorously this measure bore upon the faithful may be gathered from the observations of a Protestant traveller, Sir John Davis: "The fines are solely according to the whim of each questor. If the person fined says he cannot pay the fine, the questor goes to his house. Whatever he finds he seizes on, whether in clothing or cattle. Hence those who are rich become on a sudden reduced to abject poverty, and yet they dare not murmur. The poorer people are fined tenpence for each time they are absent on festivals from the Protestant service; and as the heretics multiply those festivals, the little property the people have is totally wasted away."

When James I. was proclaimed King the Catholics naturally hoped that the son of Mary Stuart would grant them some relief; but these hopes were speedily dashed. A new anti-Papal oath was constructed, and enforced so stringently that O'Neill and O'Donnell, with several other chieftains of the North, were forced to flee the country. The spirit in which the cruel persecution was received shines out gloriously in the words of the banished O'Donnell: "The Lord Deputy told me, in presence of many noble men and gentlemen, that I must resolve to go to church, or else should be forced to go thereto. Which threatening speech wrought that impression on my heart, that for this only respect of not going to church I resolved rather to abandon lands and living—yea, all the kingdoms of the earth, with the loss of life—than be forced utterly against my conscience and the utter ruin of my soul to such practices."

But James was not a man to stop at half measures. He forbade Catholics to send their children over-seas to be educated, and more adroitly aimed at the extirpation of Irish faith by putting all Catholic schools under the ban. The importance with which this policy was regarded is worthy of careful attention in our day. During the reign of Elizabeth the "reformers" sought to pervert the nation by carrying off the children of the nobility and gentry to be educated in England. This wholesale exportation was not without its humorous side. The head-master of Westminster school, for instance, wrote in 1618: "I have brought to church divers gentlemen of Ireland, as Walshes, Nugents, O'Reillys, Shees; Peter Lombard, a merchant's son of Waterford, and others bred popishly." Yet the effect upon these young fellows was not all that this zealous instructor could wish; for he added: "I would be glad to hear what report is made of my usage of young Barry. He is extreme popish for his age. Yet I have given orders that he shall not be any ways strangely dealt with because of distrusting his father, although he refuse to go to church." The pathetic side of the picture is the fact that some of the best families of Ireland were perverted by this ingenious but brutal policy.

Charles I. was of a mild disposition, and little favoured drastic measures; yet so strong was the popular hatred of "popery" that the Catholics, in Challoner's phrase, "had a very bad time of it under his government." They offered to purchase toleration by the payment of a large sum of money; Charles pocketed the money, but failed to keep his part of the bargain. Monasteries were seized and sold with fresh zeal to replenish the royal exchequer; though