country—social or private crime is so extremely rare in Ireland that it was almost impossible to find a case for examination. In such a case there would have been no sympathy with the convicted criminal, and the surgeon would have been permitted to conduct his investigation at his leisure; but in the majority of cases in Ireland the crime for which executions are performed is agrarian crime, and is semipublic in its character, exciting sympathy among large masses of the misguided population who agree with the murderer; and this calls for great care and caution on the part of any scientific man who would make a man who has shot his landlord a subject for investigation. At last, ladies and gentlemen, a brilliant idea came across my mind, which, however, I was reluctantly compelled to set aside. I thought to myself, what in the world is to hinder me from taking a farm in Westmeath, deliberately and wilfully refusing to pay my rents, and in due time shooting my landlord, and, instead of using him as a New Zealand tenant would, dissecting him at my leisure. Then I have my muscular coefficient problem and all my problems resolved. I need not say that further consideration led me to the conclusion that there were inconveniences attached to this course, and public opinion in Ireland, I can assure you, would not sanction the shooting of a landlord for the purpose of determining the coefficient of muscular force.

In conclusion, I would wish to say a word as to the principle I have adopted. I have shown you that the planet moves in its orbit as a lazy intelligent creature would who was anxious to perform an allotted task with the least trouble to itself; that a ray of light describes its path by the same sort of apparently instinctive action; that the poor old oyster-woman, ignorant of what she is doing, instinctively walks across the varying road she has to travel in the path of the least action; that the bee constructs its wonderful cell so as to produce a given amount of storage for its honey with the least possible amount of trouble to itself; and in a case that I was not able to bring before you for want of time, of the tendons of the legs and arms of animals, I could show that these are constructed with a wonderful economy of force of the same kind as that with which the bee constructs its cell; and I hope to show, in a future lecture, that the limbs or muscular organs of every animal are also constructed on this strange principle; as if each one of these things was itself instinct with life and reason, as Kepler really and from his heart believed. Is it by the intelligence of the planet that it moves in its orbit? Does the light travel in its path by its intelligence? Does the poor oyster-woman calculate the road by which she goes as she instinctively walks across the strand? Who has weighed out and regulated the weight of the tendons of our arms and hands? And by what force or by what intelligence do the limbs of animals describe their proper path? Who places the socket of each joint in the exact position (which can be calculated with unerring certainty by mathematics) which enables the muscle to perform its allotted task with the least amount of trouble to itself? It is not by their intelligence, by their instinct: it is not the instinct of the planet, or of the oyster-woman, or of the bee, that guides them in their path. There is instinct; there is knowledge; there is foresight; there is calculation: it is the knowledge, the foresight, the wisdom, and the calculation, of the Great Architect and Geometrician of the Universe.

ON THE TREATMENT OF POISONING BY CARBOLIC ACID.

By CHARLES ROBERTS, Esq.

ACCIDENTAL and suicidal poisoning by carbolic acid is now of such frequent occurrence, that it is a matter of importance that we should come to some definite conclusion as to the best antidote and the most suitable treatment to be adopted in such cases. Considerable difference of opinion exists as to the manner in which death is produced by this substance. Some believe that it is due to nervous shock, produced by the local lesions of the mouth, gullet, and stomach; and that the carbolic acid is not absorbed into the system. Others, again, believe that it is absorbed, and produces death by acting on the brain as a narcotic poison; while a third class hold that its action is due to chemical changes produced in the blood, and consequent impediment in its circulation, congestions of the brain, lungs, etc. It is much to be regretted that more complete reports have not been made of the numerous cases which have occurred, especially in public practice.

In the cases reported by Dr. Ogston and Dr. Irvine, of Aberdeen, in the *BRITISH MEDICAL JOURNAL* for February 4th, 1871, and by Dr. Barlow, of Manchester, in the *Lancet* for March 20th, 1869, the carbolic acid was recognised by its odour in the brain, liver, and other organs, and the blood was coagulated and otherwise altered in character. It will be remembered, too, that one person died, and the lives

of two others were endangered, by the application of the acid to the skin for the cure of itch. In one of the provincial hospitals, a patient died from the administration of an enema containing carbolic acid; and numerous cases have been recorded in which the application of dilute carbolic acid lotions to wounds have produced urgent and often dangerous symptoms of poisoning. There can be little doubt, therefore, that the poison is absorbed into the system. When the acid is concentrated, and in large quantity, and the stomach empty, it would, like any other corrosive substance, by destroying a large surface of mucous membrane, produce death by shock; but even where this has occurred, as in Dr. Barlow's case, some of the poison was absorbed.

In all cases, whether death has resulted or not, the symptoms have been those of collapse; the milder cases often accompanied by severe vomiting, the severer ones by convulsions. These symptoms, following rapidly on the administration of the poison, point clearly to the nervous system as the part first affected, the circulatory derangements being secondary, or, in a great measure, even *post mortem*. An interesting case reported by Dr. Lightfoot in the *BRITISH MEDICAL JOURNAL* for April 2nd, 1870, confirms this view. A lotion containing only two per cent. of carbolic acid was employed as a dressing to a case of excision of the elbow-joint, on three successive occasions, and on each occasion severe vomiting and dangerous symptoms of collapse followed, but again subsided on substituting a poultice for the lotion. It is quite incredible that so small a quantity of acid, absorbed by so small a surface, could have produced such urgent symptoms by any chemical action on the blood. Dr. Lightfoot refers to similar cases in the Guy's Hospital and University College Hospital Reports; and it is quite probable that symptoms, which are often attributed in surgical practice to anaesthetics, are due to the carbolic acid employed as dressings.

The indications for treatment are—to remove the poison from the stomach as speedily as possible, to neutralise its action, and to treat the general symptoms of collapse in the ordinary way. A mixture of olive oil and castor oil has been recommended, and employed in some cases, with the object, I suppose, of diluting and carrying off the poison by the bowels, on the theory that it acts only as a corrosive, and is not absorbed. As we know that it is absorbed, it would be doubtful practice to continue this treatment, and to make the acid run the gauntlet of the fat-absorbing surfaces of the small intestines. As carbolic acid is very slightly soluble in water, probably the speediest and most effectual way of removing it mechanically from the stomach, would be to administer large quantities of warm water, or mustard and water. As it is very soluble in glycerine, that substance, with water and sulphate of zinc, might be employed, after the bulk of the poison had been removed by the former plan. From the serious action of the acid on the mucous membrane, the stomach-pump should be employed with great care, and probably would often be inadmissible. I know of no substance capable of neutralising the acid chemically; but its well known affinity for albuminous compounds would point to eggs, and finely mixed or powdered raw meat, as likely to be of service. If eggs were used, it would be necessary, for obvious reasons, that they should be very much diluted, by being whipped up with milk or cold water. Milk is not coagulated by carbolic acid, and therefore would not act as a neutraliser, but it would be a more suitable application than oil to the injured mucous membrane, and less likely to produce further discomfort to the patient. The general symptoms of collapse must be treated in the usual manner, by internal stimulants, and friction and warmth to the skin. The rectum would be the most suitable part to which stimulants should be applied. If raw meat were given, it might be well seasoned. As brandy dissolves carbolic acid, and is itself speedily absorbed, its administration by the stomach would be contraindicated.

POISONING BY NITRATE OF SILVER.

DURING the period of my house-surgeoncy at St. Mary's Hospital, Paddington, a similar accident to that recorded by Mr. Scattergood of Leeds occurred to me. A piece of nitrate of silver, with which I was painting the fauces of a child four years old, broke, and the larger part of the caustic stick was swallowed. I produced immediate vomiting by forcing my fingers on to the gullet, and sent to the kitchen for a large supply of milk, of which I pumped several pints into his stomach and out again. The child had dysenteric symptoms during the next three days, and occasional vomiting. It was kept on an exclusively milk diet, and recovered. Milk is an excellent antidote to nitrate of silver, in virtue of its large proportion of suspended albumen. I use it in lieu of salt and water for neutralising the excessive effects of even the mitigated caustic, when employing it locally on the mucous membrane of the eyelids.

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