THE RELATION OF FOREIGN SUBSTANCES TO THE HUMAN BODY*

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Man is constantly beset by dangers from cold and storm, by pathogenic organisms, and by the impaction of moving objects; and from the remotest times foreign bodies and baneful missiles have penetrated his tissues and lodged in his body. It has been affirmed that military surgery had its origin in the treatment of wounds inflicted by darts and arrows during the siege of Troy, and some of the earliest surgical instruments were designed for the extraction of arrow-heads in the long Peloponnesian war over 400 years before the Christian era. But all foreign bodies are not of a harmful nature; in the Middle Ages they served as ornaments and charms to heal disease and to avert evil spirits, and at the present time they are deliberately inserted into the body in the course of many surgical operations.

On the Surface of the Body

Precious stones and gems set in gold have from time immemorial enhanced the charms of the most beautiful women of the age; and in the far distant past, 5,000 years before Christ, the pre-Dynastic women of Egypt wore necklaces of cornelian and agate, amulets in faience, and bracelets inlaid with lapis lazuli and fastened by flowers made of gold. In Peru the wearing of ornaments was not confined to the gentler sex. When the royal offspring had reached the season of manhood, the Inca, addressing them affectionately as "Children of the Sun," pierced their ears with a golden bodkin, which was allowed to remain until an opening had been made large enough for enormous pendants, which gave them, with the Spaniards, the name of Orejones. This ornament was so massy in the ears of the sovereign that the cartilage was distended nearly to the shoulder, producing what seemed a monstrous deformity in the eyes of Europeans, though, under the magical influence of fashion, it was regarded as a beauty by the natives. The Botocudos, a savage Brazilian tribe, practised similar customs, and inserted wooden plugs into the lower lip and lobes of the ear, causing great protrusion of the lip and a wide repulsive mouth.

In mediaeval times superstition vied with religious fanaticism throughout Europe and Asia; talismans and amulets were worn by the devout, and the relics of saints were more valuable than gold or precious stones. An enlightened age may scoff at the beliefs and superstitions of the Middle Ages, but the plague, or Black Death, which spread over Europe and wiped out a quarter of the population, may well have driven men's thoughts to charms and talismans which happily might avert the impending calamities of mankind. Nor did Great Britain escape from the superstitious practices of the times. "Pooh," said Raleigh; "I wear an amulet and have a spell of art-magic at my tongue's end." In Scotland, necklaces of coral beads are thought to possess magic powers; and in the marriage ceremony the finger ring still holds as prominent a place as it did amongst the superstitious marriage rites of the ancient pagan world. Poisoned rings are said to have been the invention of the Italians, who inserted the poison in a receptacle where the jewel is usually set. Attached to the inner surface of the ring was a sharp point which, when the hand of the wearer was grasped, scratched the flesh and injected the poison. Rings were also used for carrying strong poisons secretly, such as arsenic and corrosive sublimate, and in this manner many were enabled to commit suicide after being imprisoned.

An animal's hide, substituted for human skin, is the most amazing of all foreign substances found on the surface of the body.

Macgowan¹ states that traders in the Chinese Empire kidnap a boy, skin him bit by bit, and transplant on the denuded surfaces the hide of a dog or bear. The subject must be rendered mute by destruction of the vocal cords, made to use all fours in walking, and must be submitted to such degradation as to blight all reason. The process is so severe that only one in five survive. A "Wild Boy," exhibited in Kiange, had the entire skin of a dog substituted and walked on all fours. It was found that he had been kidnapped, and his proprietor was decapitated on the spot.

The Papuans of Dutch South Guinea have a peculiar custom of fastening into the muscles of the right arm a certain portion of the flesh of a boar and of allowing it to remain there, to fester slowly, putrefy, and wither. They profess to gain strength from the animal in this manner.

In the Tissues

Small sterile bodies are soon encapsuled and become sufficiently inert to escape our notice and our memory. Needles may travel for a considerable distance from their point of entry. In 1802 Dr. Lettsom spoke of an old lady who sat on a needle; it passed from the injured leg to the other, from which it was extracted. Cases of tetanus have arisen from air-gun pellets and spicules of wood. Infected objects cause local suppuration and, if near the surface, soon become extruded; but shrapnel or shell-case, lying in the deeper tissues or impacted in bone, remain embedded in the depths, and may excite recurrent attacks of inflammation. During the great war, anaerobic organisms were carried into wounds by missiles bearing threads of khaki and particles of the actual soil of the battlefield. Many of us have not forgotten the pale, restless men, scarcely recovered from the initial shock and haemorrhage of their wounds, the emphysematous limbs, and the grey-green muscles which discharged a thin, offensive, putrid pus characteristic of the most tragic of all infections.

What is the relation of foreign substances to malignant disease? Chimney-sweep's cancer has been traced to particles of soot; repeated applications of tar have caused epitheliomata; cancer of the tongue has followed irritation from a denture; and the pressure of a pipe-stem predisposes to tumours of the lip. Yet there are no grounds for supposing that metallic bodies which have lain for many years in the tissues play a part in the etiology of malignant disease. Tissue reactions undoubtedly occur. Foreign bodies excite a growth of fibrous tissue; Lane's plates have led to the formation of adventitious bursae, and cases of paraffinoma of the rectum have followed the treatment of prolapsed piles by paraffin injections.

Results in modern surgery depend on the asepticity of suture material which can be left with safety in the closure of wounds. In the past, buried ligatures were a common source of sepsis, and secondary haemorrhage from large vessels was not unusual; but with the dawn of the aseptic era septic ligatures have been forgotten, and foreign bodies are now freely used in surgery. The fractured ends of bones are fixed in apposition with plates, screws, and intramedullary bone pegs, skull defects are closed with sheets of metal, and innumerable silver clips control haemorrhage from small bleeding vessels in cerebral operations. Within recent years radium needles and radon seeds have been used in the treatment of certain types of malignant disease. But our methods are not yet fool-proof, and a lurking fear still haunts a surgeon's mind that he unwittingly may leave a gauze strip, drainage tube, or artery forceps in the peritoneal cavity. Such delay the healing of wounds and may cause intestinal obstruction. Lester Williams² reports a case of acute intestinal obstruction due to a drainage tube left in the abdomen twelve and a half years before.

In August, 1912, an appendicular abscess was drained with a rubber tube, the appendix was removed three weeks later and the patient made an excellent recovery. He was readmitted in January, 1925, suffering from intestinal obstruction. A tubular structure was discovered passing from the right iliac fossa into the left side of the pelvis. This proved to be a piece of rubber tubing 15 cm. in length and 1 cm. in diameter. The distal part of the tube, together with three

* A paper read before the Aberdeen University Medical Society.

feet of the small intestine, had passed through an aperture in the root of the pelvic mesocolon. The bowel was reduced and the opening in the mesocolon closed; the patient made a good recovery. Moynihan³ mentions an interesting case: a woman underwent an operation for appendicitis. Three years later the abdominal cicatrix gave way and thirty-four strips of gauze were extracted one by one. The operator had not dressed the wound himself, but had ordered that one strip of gauze should be introduced daily. This was done most conscientiously and, as he had omitted to direct the daily removal of the strip, thirty-four were introduced but never removed; the wound ultimately healed over them. Metal instruments ulcerate into neighbouring organs. In 1922 Dr. Leach of Beaulieu presented to the surgical museum of Aberdeen University a pair of pressure forceps removed from the rectum of a woman thirteen years after a hysterectomy

Artery forceps removed from the rectum.

had been performed for a myoma weighing 11 lb. In the interval the woman had suffered attacks of partial intestinal obstruction. The forceps lay embedded in the posterior wall of the rectum, and on removal was found to be deeply eroded.

Central Nervous System and Organs of Special Sense

Although a seemingly trivial wound has caused death, amazing degrees of trauma have been borne without a fatal issue.

In the famous "American crow-bar" case⁴ a premature explosion drove a tamping iron, 43 inches long, 1½ inches in diameter, and 13½ lb. in weight, completely through a man's head. He did not lose consciousness, and walked up a flight of stairs to have his wound dressed. His convalescence was uneventful, but it is said he was no longer capable of performing the duties of a foreman. An equally wonderful case is described by Dubrisay,⁵ of a man aged 44, who forced a dagger 10 cm. long and 1 cm. wide into his brain. He held the dagger with the left hand, and with a mallet in his right, he drove the dagger inwards. An attempt at extraction failed. He was then placed on the ground, and held by two persons, while traction was made with a carpenter's pliers. The dagger refused to move. He was then taken to a copper-smith's, where he was fastened by rings to the ground, and strong pincers were placed over the dagger and attached to a chain which was attached to a cylinder revolved by steam force. At the second turn of the cylinder the dagger came out. During the extraction the patient remained perfectly cool and complained of no pain. He soon returned to work.

During the great war, lacerated scalp wounds, depressed fractures of the vault, and long-infected tracts containing fragments of bone, projectiles, and disintegrated brain substance, presented interesting problems in surgery. Although the accurate localization of foreign bodies gave a decided impetus to surgical attack and careful debridement of the scalp and cranial bones afforded a promising results, wounds with dural perforation showed a high immediate mortality from meningitis and encephalitis. This mortality was ultimately reduced by Cushing's method⁶ of "catheter suction," by means of which debris and small foreign bodies were removed and fragments of bone or shell-case were discovered in the depths of the wound. It is interesting to note that recovery has followed the extraction of foreign bodies from the ventricles.

Although the eye is protected by the lids and by the projecting margins of the orbit, foreign bodies frequently enter the palpebral fissure or penetrate the globe of the eye. Particles of steel or chips of stone become embedded in the cornea, and a beetle's wing, diaphanous and invisible to the naked eye, may excite a puzzling reaction. Peculiar accidents have followed a simple operation: an ophthalmologist in Glasgow describes a case in which a piece of silver plating became detached from an iris forceps during a cataract operation and fell into the anterior chamber.

The eye had to be removed. Very rarely a foreign body is retained in the vitreous or retina for a long period without loss of vision. Snell records a case in which a piece of steel was embedded close to the optic disc with retention of sight. It was visible by the ophthalmoscope eighteen months after the accident, and no diminution of sight was apparent. The danger of sympathetic ophthalmia from an eye containing a foreign body is well known.

Small foreign bodies are frequently found in the nasal cavities of children. Hickman⁷ gives an instance of a steel ring which for thirteen years had lain in the nasopharyngeal fossa. Waring⁸ mentions the case of a housemaid who carried a rhinolith for twenty-five years; the nucleus was found to be a cherry stone. A pea, impacted in the nose, has been known to sprout.

Children have the habit of inserting small objects into their ears. Winterbotham⁹ reports an instance in which a cherry stone was removed from the meatus auditorius after lodgement of sixty years. Acute suppuration, meningitis, and cerebral abscess have followed perforation of the tympanic membrane.

A case is recorded in Schmidt's *Jahrbücher* of a boy who introduced a carob-nut kernel into his ear. On the next day incompetent persons attempted to extract the kernel, but caused only pain and haemorrhage. In the afternoon the auditory canal was found red and excoriated, and deep in the meatus the nut was seen covered with blood. Intense fever and delirium ensued, and chloroform had to be given before the nut could be extracted. It was found that an agglutination of wax and blood had increased its size. Unfortunately coma and signs of meningitis appeared, and four days after the operation the patient died.

Cardio-vascular System

The heart may be penetrated by missiles from without or by needles migrating from the oesophagus. It has been said that the contracted heart of a healthy man is as rigid as the biceps of an athlete; and that a foreign body which threatens to pierce the organ may be turned aside in its course. Death is not always instantaneous, but secondary haemorrhage, septic complications, and embolism frequently lead to a fatal issue. Curran¹⁰ mentions the case of a soldier who, in 1809, was wounded by a bullet which entered the body to the left of the sternum between the second and third ribs. There was little haemorrhage from the wound, and he survived fourteen days. The bullet was found in the pericardium. A remarkable degree of tolerance is shown to metallic objects; bullets and needles have lain for twenty years encysted in the wall of the heart. Foreign bodies, penetrating the chest wall, are drawn inwards by the action of the heart muscle.

Osler¹¹ reports the following case. A medical student, while on the spree, thrust a pin into his heart. The pericardium was opened and the head of the pin was found outside the right ventricle. An attempt was made to extract the pin, but it passed into the heart and, it is said, caused the patient no further trouble.

Leriche¹² relates the history of a boy who fell on the point of a needle. His mother felt in the third interspace a minute elevation which moved with every beat of the heart. A few hours later Leriche found that the needle had been drawn inwards, and now lay in the thin wall of the auricle. He extracted it and closed the cardiomyotomy wound with a single stitch. The child recovered.

With the advent of the great war, surgeons were given an unparalleled opportunity of studying the movements and course of foreign bodies which were capable of migrating from their point of entry. It became possible to compare the incessant whirling of a shrapnel ball in the right auricle with the slow swing, during systole and diastole, of a piece of metal in the left ventricle of the heart. Small shot and rifle bullets traverse the arterial or venous systems. Pellets, entering the left auricle, have found their way to the small peripheral arteries; and a rifle bullet, penetrating the left side of the heart, has come to rest in the femoral artery, causing ischaemic gangrene of the limb. Projectiles travel with or against the venous current. A shell fragment, displaced from the

periphery, may reach the heart or enter the pulmonary circuit; and a piece of metal, seen oscillating in the right auricle, may be found a few minutes later in the internal iliac vein. Foreign bodies causing menacing symptoms should be removed, and a deliberately planned operation has a fair chance of success.

Zoege von Manteuffel¹³ extracted a projectile from the posterior wall of the right ventricle in the case of a woman of 21. After the pericardium had been opened, the entrance wound of the bullet was seen upon the right ventricle 6 cm. from the apex. A blood stream, 50 cm. in height, spurted with each diastole. The orifice was closed by a silk suture and the bleeding stopped. The bullet was felt in the posterior wall of the right ventricle 1 cm. from the coronary artery. The heart was now lifted up by means of two fixation sutures, and the operator cut down upon the bullet, which he pressed out between the thumb and the left index finger. The second wound, which bled but slightly owing to digital compression, was sutured, and the patient made a good recovery.

Respiratory System

The accidental inspiration of a foreign body has frequently resulted in asphyxia and death. Crile has shown that foreign bodies in the upper part of the larynx, by irritation of the terminal branches of the superior laryngeal nerves, may give rise to serious and often fatal collapse from reflex inhibitory action of the heart or respiration. A young man of 23, who was anaesthetized in order to extract a tooth, had a cork placed between his teeth to keep his mouth open. The tooth was extracted but slipped, together with the cork, into the pharynx. The tooth was ejected in an effort at vomiting, but the cork entered the larynx, and after violent struggles the patient died from asphyxia in an hour. History relates that children, while playing with toy balloons which they inflate with their breath, have by inspiration reversed them and have drawn the rubber of the balloon into the opening of the glottis, causing death. Fatal results have been averted by a violent fit of coughing, inversion of the body, or by tracheotomy. Foreign bodies may remain for many months in the larynx without the patient's knowledge.

Lennox Brown,¹⁴ on examining a woman for suspected laryngeal carcinoma or phthisis, found a tooth-plate impacted in the larynx. She had lost her false teeth during an attack of vomiting twenty-two months previously and, finding her teeth missing, assumed that they had been thrown away with the vomit.

Gould and Pyle¹⁵ reported an ingenious criminal device. The discovery on an Indian prisoner of a heavy leaden bullet, 3/4 inch in diameter, led to an inquiry, when it was ascertained that the ball served in the formation of a recess at the base of the epiglottis. The ball is allowed to slide down to the desired position and retained for half an hour at a time. This operation is repeated many times daily until a pouch results in which criminals contrive to secrete jewels and money in such a way as to defy the most careful search, and without interfering with speech or respiration.

Coins, tacks, pins, beans, and collar studs may pass through the glottis and enter a bronchus. Young children suffer most frequently on account of their habit of testing all things with their mouths. The act of coughing, laughing, or crying may cause a small object to be drawn into the larynx. After an attack of choking, characterized by cyanosis and aphonia, the irritation subsides; and a spasmodic cough with muco-purulent sputum may suggest pulmonary tuberculosis.

Lilienthal¹⁶ reports the case of a boy of 6, who developed attacks of dyspnoea and cough immediately after tonsillectomy, when suction by means of a rubber tube had been employed. Numerous physicians had been consulted and various diagnoses made. Five months later an opaque body, the size of a bean, was seen under the fluoroscopic screen in the upper part of the chest. With each cough or expulsive effort the object flew upwards towards the neck, dropping back to its original position in the interval. A fragment of rubber tubing, which must have been detached during the previous operation, was extracted with the aid of the bronchoscope.

An infected parenchymatous focus, surrounding a foreign body in the lung, may give rise to pneumonia, abscess, or gangrene.

Lapeyre¹⁷ mentions an elderly gentleman who, while smoking a cigarette, received a sudden slap on the back, causing him to start and to take a deep inspiration. The cigarette was drawn into the right bronchus, where it remained for three months. Pneumonia supervened, and two months later, during a violent fit of coughing, the cigarette was expelled enveloped in a waxy, mucus-like mass.

Smallpeice¹⁸ reports the case of a baby in which a flower-spike of grass 1½ inches long passed through the upper air passages and lung tissue, and was removed from a swelling below the angle of the right scapula. A sinus led directly into the right bronchus.

During the Boer and the Russo-Japanese wars, bullet wounds of the lung seldom required surgical treatment; but, with the advent of the great war, surgeons were soon disillusioned by the high mortality caused by large jagged projectiles, whose edges were plastered with debris and pieces of clothing. If death did not take place in the first two days from open sucking wounds, haemorrhage and sepsis took a heavy toll at a later date. In the extraction of foreign bodies from the lung, it is interesting to contrast the open methods of Duval, Tuffier, and others, with the close method of Petit de la Villéon.

Alimentary System

"There is a providence which watches over innocence and folly," and it is surprising how constantly foreign bodies, if uniform in contour, pass through the oesophagus and, after a brief rest in the stomach, travel through the pylorus, the ileo-caecal valve, and are passed per rectum. Hundreds of coins are swallowed by children, and operative intervention is seldom necessary. A lunatic in England swallowed 10 oz. of screws and bits of crockery, all of which were passed by the anus. One of Forille's patients swallowed an entire set of dominoes. Fear of robbery has often led to the swallowing of money or jewellery. Vaillant, the celebrated doctor and antiquarian, after a captivity of four months in Algiers, was pursued by Tunis pirates and swallowed 15 medals of gold; on arriving at Lyons he passed them all per rectum. But fortune has not always smiled so kindly if we credit the fate of the fourteen pages of Mahomet the Second, whose bellies were ripped open in search of a stolen melon. Foreign bodies with sharp edges may abrade or perforate the oesophageal wall, causing a suppurative mediastinitis, and many fatalities have followed the swallowing of artificial dentures. Needles and fragments of bone, migrating from the oesophagus, have penetrated the liver, the heart, the aorta, and the portal vein. There are many cases on record in which injury to the gullet or stomach has taken place in the juggling process of knife- or sword-swallowing. In 1502 Florian Mathias removed a knife, 9 in. long, from the stomach of a man of 36, followed by complete recovery. Bell performed gastrotomy on a man who, while attempting a feat of legerdemain, allowed a bar of lead, 10 in. long, 1½ in. wide, and 9½ oz. in weight, to slip into his stomach. The bar was extracted and the man recovered.

Hair balls of great size have been found in the stomach of hysterical women who have been in the habit of eating their own hair. Osler¹⁹ describes a specimen in the medical museum of McGill University, which formed an exact mould of the stomach. The tumours are often mistaken for cancer. Many have been diagnosed only on the post-mortem table.

Powdered substances may cause death through violent irritation of the stomach, and the ancient belief that gold leaf and diamond dust were deadly poisons has its origin in antiquity. The Chinese are supposed to have used gold as a poison, especially for suicidal purposes, and at the present day, when a high official puts an end to his life, it is officially announced "he has taken gold leaf." Madame de Montespan, one of the favourites of Louis XIV, a woman of great beauty, died suddenly at the age of 26, and it was generally believed that she had been poisoned by powder of diamonds mixed, instead of sugar, with strawberries.

With the exception of gall-stones and enteroliths, foreign bodies rarely cause obstruction of the bowel. Nevertheless a medical man once told me the following tale. A few

years ago he was seized with intense abdominal pain and persistent vomiting; and an eminent surgeon, having diagnosed acute intestinal obstruction, advised immediate laparotomy. But the patient, while awaiting his operation, remembered a lump of cheese hastily swallowed the day before, and with excellent judgement decided that an ounce of ol. ricini would probably relieve his symptoms. A body is most likely to lodge in the lower ileum or caecum, and ulceration of the bowel may lead to a perforation and death, or may induce the formation of an abscess, upon the evacuation of which the foreign substance is safely discharged. Roose,²⁰ in the *Lancet* of September 9th, 1893, illustrates the passage of an iron teaspoon from the colon through the abdominal parietes. It had been swallowed five weeks before. Intestinal diverticula delay the passage of a foreign body. I have found a fish-bone in a duodenal diverticulum, a piece of paper, such as one finds adhering to ginger-cake, 1/2 by 1/2 in. in the crater of a gastric ulcer, small shot in the lumen of an appendix, and a rabbit's rib projecting through the mucous membrane of the rectum into the cavity of an ischio-rectal abscess.

Inanimate objects are introduced into the rectum to relieve the persistent pain of haemorrhoids, or the intolerable itching of pruritus ani and to gratify abnormal sexual desires. Anal discomfort is often alleviated by the presence of a metallic substance in the rectum, and there is at present on the market a cone-shaped body named "the little wonder" which seldom belies its title.

Poulet²¹ gives a comprehensive list of foreign bodies found in the rectum, among which he describes an ale glass, crockery, a fork, the handle of a shovel, a preserve jar, a pepper-box, and a bottle of mushrooms.

Lockhart-Mummery²² quotes several interesting cases: a monk who, to cure a violent colic, introduced into his fundament a bottle of "l'eau de la reine de Hongrie" with a small opening in its mouth by which the contents, drop by drop, could enter the intestine; a Dutch peasant who inserted a smooth stone, 900 grams in weight and 17 cm. long, to relieve a prolapse; a convict at Brest, who introduced a box of tools, which was found in the transverse colon, and contained a piece of gun-barrel, a screwdriver, a saw for cutting wood, and several other instruments.

Cases of poisoning have been reported from phosphorus matches and tobacco.²³ A convict, admitted to Liverpool prison in excellent general health, was found four hours later in a state of collapse with nausea, vomiting, and paralysis of the legs. He had secreted an ounce of cut Cavendish tobacco in his rectum to convey it past the searchers. Nor has the rectum been immune from the methods of torture which darken the pages of mediaeval history.

Female Genito-Urinary System

Transuterine insufflation of the Fallopian tubes, the watchspring pessary, the Gräfenberg silver ring, and other ingenious devices enable gynaecologists to maintain an even balance between fertility and sterility. Conception is no longer left to chance, and future generations will doubtless find that the determination of sex is in accordance with their wishes. Foreign bodies, inserted in the treatment of pelvic disorders, have escaped the memory of both doctor and patient. Poulet²⁴ mentions an interesting case: a pregnant woman was examined by a doctor, who suspected carcinomatous degeneration of the neck of the uterus. Capuron, who was consulted, did not believe that the state of the woman's health warranted the diagnosis; and on further examination the "growth" was found to be a sponge, which had been previously introduced into the vagina. There are many cases on record in which pessaries have been retained in the vagina for thirty years. Glass pessaries are not changed by the vaginal secretion, but metal instruments are eroded and become encrusted by calcareous salts. A broken glass douche nozzle, left in the vagina by a careless nurse, has been known to cause temporary domestic unhappiness. Sutures, filiforms, and pieces of catheter and rubber tubing may provide a nucleus for stone formation. A doctor in the North of Scotland, on investigating a calculus removed from the bladder of a woman, found it had

formed round a condom *à l'envers*—no history of intercourse by the urethra was forthcoming.

Masturbation is responsible for the motley array of foreign substances found in the genito-urinary system. Feathers, chewing gum, and hair-pins present interesting problems to the cystoscopist; and Cabot²⁵ describes a case in which a straw, passed in through the urethra, had become engaged in one of the ureters for part of its length.

Pearse²⁶ mentions a woman, aged 36, who suffered from menorrhagia for ten days and was in a state of great prostration. He found a silk bobbin, which the patient had introduced fourteen years before. She had suffered from attacks of peritonitis and the presence of a urethro-vaginal fistula. She had been married twice, and had been cared for by physicians, but the existence of a body 3/4 inch long had never been noted.

Large objects become impacted in the vagina. Bazzanella of Innsbruck removed a drinking glass from the vagina by means of a pair of small obstetric forceps. Cloquet²⁷ describes the necropsy on a woman who had a pewter goblet in her vagina, and notes that lead oxide was found in the gangrenous debris.

Crochet hooks, scissors, knitting needles, and catheters have been used to procure abortion, and death has not infrequently followed perforation of the uterine wall, haemorrhage, and septic peritonitis.

Glaister²⁸ reports the case of a woman who passed a glass penholder with a sharp grooved point into her uterus. It slipped from her hand and disappeared. A few days later she was seized with intense abdominal pain; the abdomen was explored and the penholder was found beneath the diaphragm.

Zuhmeister²⁹ describes the case of a woman who used the twig of a tree to perforate the matrix. She thrust it so forcibly into the uterus that the wall was perforated. Although 6 inches long and the thickness of a goose feather, the branch remained for five months in the pelvis without causing any inconvenience, and was finally discharged per rectum.

A description of foreign substances entering the female genital system would be incomplete without reference to the peculiar belief, prevalent among widely different and distant races, that impregnation may follow the entrance of a foreign substance in place of the male spermatozoon. It was no unusual thing for the ancient Egyptian kings to deduce their ancestry from the immaculate conception of a virgin, and to imagine that God (Aman Rā) was their father. The monarchies both of the Huns and of the Moguls were erected on the basis of such superstition, and the miraculous conception of Zingis, ascribed to a virgin, raised him above the level of human nature. Other races give a more explicit history, and state that imprudent exposure to the rain, in bathing, or to the dripping of a stalactite has caused a woman to become pregnant. In *The Lady of the Lake*, Sir Walter Scott vividly describes the birth of Brian, following the impregnation of a virgin mother by dust blown from the bones of the long-departed dead.

Male Genital System

The ancient custom of infibulation of the external genital organs was not uncommon among the Greeks, Romans, and Asiatics. Certain of the religious mendicants in India were condemned to a life of chastity; and in the hotter climates, where nudity was the custom, the person travelled about exposing an enormous preputial ring, which was looked upon with adoration by devout women.

In September, 1929, a young man inserted his penis through a gold signet ring. He failed to remove it and, when he consulted his doctor, the ring lay buried from view in the oedematous tissues of the penis, which was exquisitely tender and of a deep purple colour. After slipping a piece of fine tin-foil through the ring to protect the penis, I relieved his embarrassment and alarm by dividing the ring with a nibbling forceps.

A few years ago a man inserted his penis into the mouth of an earthenware hot-water bottle. He failed to withdraw it and, although he got rid of the greater part of the bottle by chipping it off with a hammer, he required the assistance

of his doctor in removing the jagged stone ring which encircled the penis, and resisted all attempts at removal till fixed in a vice.

In November, 1927, a boy was admitted to the Royal Aberdeen Hospital for Sick Children suffering from a cicatrix surrounding the penis and a urethral fistula. His doctor reported that he had been called to see the boy, and had removed a piece of string tied tightly round the penis. The cord had ulcerated into the urethra, and had almost severed the body of the penis. The boy suffered from nocturnal enuresis.

Other foreign bodies found in the male urethra indicate a prurient tendency. Gross⁹⁰ found three caudal vertebrae of a squirrel in the centre of a vesical calculus. It was discovered that the patient had practised urethral masturbation with the tail of this animal.

Terrilon⁹¹ describes the case of a man of 24, who introduced a pencil into his urethra. It remained there for fifteen days, and then passed into the bladder. Following successive attempts to break the pencil, he had violent chills and an intense evening fever. On the thirty-third day Terrilon removed the pencil by operation, but the patient died of a perivesical abscess.

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- ²² Lockhart-Mummery: *Diseases of the Rectum and Colon*, 1923, 862.
- ²³ Glaister: *Text Book of Medical Jurisprudence and Toxicology*, 1910, 721.
- ²⁴ Poulet: *Loc. cit.*
- ²⁵ Cabot: *Modern Urology*, 1924, ii, 193.
- ²⁶ Pearse: *British Medical Journal*, 1873, i, 728.
- ²⁷ Cloquet (quoted by Gould and Pyle): *Loc. cit.*
- ²⁸ Glaister: *Loc. cit.*
- ²⁹ Zuhmeister: *Schmidt's Jahrbücher*, Leipzig.
- ³⁰ Gould and Pyle: *Loc. cit.*
- ³¹ Terrilon: *Bulletin de la Société Anatomique de Paris*, 1876, 651.

THE HEALTH OF LONDON

REPORT FOR 1930

The annual report¹ of London's county medical officer of health and school medical officer, Dr. F. N. Kay Menzies, shows once again how wide is the province of the chief health official in a great city. From vital statistics to private wells, from the purity of milk and water to precautions against sewer explosions, and from the provision of rescue homes to handicraft classes—all these and many other matters come under his supervision. It is no small tribute to Dr. Menzies and his staff, as well as to the progress of preventive medicine, that the death rate in the civil population reached last year so low a figure as 11.6 per 1,000. Every cause of death showed a lower figure than in the previous years, with the exception of measles. The spring of 1930 included the end of the biennial epidemic, and therefore the statistics for that year show a large number of deaths from respiratory complications. Since another epidemic of measles is due this winter, it is of interest to note the relatively enormous

death rate that this disease entails: the deaths in 1929 were 206, and in 1930 they numbered 1,027. Even this epidemic was less severe than that of 1928.

VITAL STATISTICS

The population in the County of London at the time of the census in April last is given as 4,396,821, an increase of about 100,000 on the census figure in 1921. The birth rate, as in the previous year, was 15.8 per 1,000—the lowest on record. On the whole, the year 1930 was a healthy one; epidemic diseases were comparatively rare, and mortality from influenza was particularly low. Conditions were favourable to infant life, the deaths under 1 year of age being only 59 per 1,000 births. There was, however, a marked increase in deaths attributed to cirrhosis of the liver. The mild type of small-pox continued unabated, but there were only ten deaths. No virulent small-pox occurred. The case mortality for diphtheria was 3.3 per cent., a slight increase, which may perhaps indicate a slackening-off in the use of anti-toxin—a measure which was stressed by the Ministry of Health in 1922 and 1923, with the result that the death rate diminished notably in 1923, 1924, and 1925. There were 293 notifications of puerperal fever and 740 of puerperal pyrexia during the year—a slight decrease on 1929. The death rate from puerperal fever and other accidents of childbirth was 3.33 per 1,000 births, rather more than half being due to puerperal fever.

One fatal case of anthrax is reported in an employee at a flour and grain wharf; its origin could not be traced. Of 88 notified cases of cerebro-spinal fever, 75 were confirmed, and 51 of these patients died; a further 29 deaths occurred in unnotified cases or cases notified in 1929. There were 45 confirmed cases of adult encephalitis lethargica; of these, 16 patients died. The whole of the special accommodation for these cases at Winchmore Hill (50 beds) was occupied at the end of the year, and so great was the number waiting admission that 115 more beds are to be provided. The report of the school medical officer, which appears as a separate publication² this year, contains a survey of the disease among children. There were 4 deaths among 30 proved cases of poliomyelitis and polio-encephalitis.

The year 1930 was marked epidemiologically by one unprecedented disease in the town—yellow fever. A fatal case occurred in a laboratory worker who was engaged in research on this disease; there were two other severe cases and three milder cases, but these patients recovered. It was thus shown that species of mosquito other than *Stegomyia fasciata* can carry the disease, that the infection can penetrate the unbroken skin, and that laboratory work which involves handling apparatus contaminated with infected blood is extremely dangerous. The investigation was therefore stopped.

There were 6,908 deaths from cancer—a slight increase—with a death rate per 1,000 of 1.57. The tuberculosis death rate was 0.87 per 1,000 living.

COMMON LODGING-HOUSES

The report contains an interesting historical survey of the attempts made to provide lodgings for seamen, and the peculiar difficulty of the Chinese seamen. There are now 152 licensed common lodging-houses, and 22 seamen's lodging-houses; the supervision of these entailed 7,582 day visits and 212 night visits by the inspectors during the year. Opium smoking has now practically ceased in the lodging-houses, owing to the operation of the by-laws and the Dangerous Drugs Acts. A census of homeless persons in the city, taken on February 14th—a cold night—showed 54 men and 25 women in the streets, 14,855 persons in common lodging-houses, 631 men, 117 women, and 18 children in free shelters and homes, 724 men and 16 women in casual wards, and 5,014 men in Rowton houses. There has been a steady decrease in the number of homeless persons, except for the low figures obtained during the latter years of the war. Apparently very few women are really homeless nowadays. The lodging-houses are very much cleaner than they used to be, and there was

¹ London County Council. Annual Report of the Council, 1930. Part I, vol. iii. London: P. S. King and Son, Ltd. 1931. No. 2850. (1s.)

² See *British Medical Journal*, October 3rd, p. 612.