CREMATION.*

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IN tendering you my thanks for paying me the compliment of requesting me to read a paper on this occasion, I have to do so in a double sense—first, for the compliment itself, and, secondly, for relieving me of the embarrassment of choosing the subject of it. I must at the same time acknowledge that, in my opinion, the subject is well chosen, because, in addition to its importance, it is of especial interest at the present time, when, for various reasons, more attention is being given to it by thinking men, public bodies, and sanitary authorities than ever before, as far as I am aware.

The question of the disposal of the dead presents several aspects; it is always with us, it concerns every member of the community, and in addition to its social, economic, and sentimental sides it has another, which is more important than all the rest, and especially interesting to us medical officers of health—I mean the sanitary side.

It will be conceded that in a matter exerting such a powerful influence on public health we may profitably consider or reconsider the question, and be in the position of having made up our minds and of being able to give a decided opinion upon it—a reason for the faith that is in us—when consulted either by our respective authorities or by others.

The question naturally suggests itself at the outset, What is the *natural* method? But on looking for an answer, one soon finds that there is not only one, but several methods which may be regarded as natural. It will be interesting as well as advantageous to briefly review these, so that we may decide the still more important question, What is the *best* method?

It is, of course, impossible to determine how the first dead human body was disposed of, but we learn from history what methods have been employed from very ancient times, and the following are proved to have been used at different epochs in some country or other, and several of them in the same countries:

1. Exposure to the air, with or without the access of beasts, birds, insects, and still lower forms of life.
2. Embalming, or preservation by various means.

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3. Burial in the sea.
4. Interment, inhumation, or earth burial.
5. Cremation, or rapid resolution by fire.

All these methods may be considered more or less Nature's own. The first is common in desert places, and is, perhaps, Nature's most common form of resolution, for everywhere the living feeds on the dead. As to the second, the bodies of men as well as of animals which lived in very remote times are occasionally brought to view by the advance and thawing of glaciers, having been naturally embalmed by the combined agency of extreme cold and the exclusion of air, conditions unfavourable to decomposition. The sea forms the grave of thousands every year. Inhumation, or earth burial, occurs when a body left on the ground becomes, through the agency of wind, covered up with sand, dust, and other matters; while destruction by fire—occasionally effected by lightning, volcanoes, and accidents—is by no means rare.

Exposure of the Dead is practised only by few races. The Persian Magi, being only solicitous about their bones, exposed their flesh to the prey of birds and dogs. The Parsees of India, who are a remnant of the ancient Persians, in like manner expose their dead upon tombs called "towers of silence." These towers are erected in solitary places—generally on mountains—and bodies placed on iron biers are there exposed to the attacks of vultures and other fowls of the air, which very quickly devour the flesh, leaving only the bones; these fall through an iron grating into a receptacle beneath, from which they are afterwards collected and consigned to a subterranean passage constructed for the purpose.

The Colchians, an ancient people dwelling near the Black Sea, are said to have made their graves in the air, or, according to Nicolaus, "The Colchi do not bury their dead, but suspend them on trees." The bodies, however, were first sewn up in skins to protect them from birds of prey.

In climates characterized by great heat and dryness of the atmosphere, decomposition is greatly impeded, so that exposure is not productive of those loathsome effects which result under opposite conditions.

A peculiar custom of abandoning the dead exists among the Chatham Islanders, who live mainly by fishing. It is based on a superstitious belief that their brother fisherman who has died will bodily rise again and ply his craft. They place the body of their kinsman in a canoe, and lay between his fingers a baited hook and line. The canoe is then solemnly sent adrift upon the great ocean to float, it is supposed, to some far-off isle, where his resurrection

and the resumption of his old calling will take place. This custom is really one of exposure.

Embalming by natural means I have already spoken of; embalming by artificial methods requires only a few words.

The Egyptians carried the practice out to a fuller extent than other nations, and there are probably few persons who have not seen mummies which were embalmed several thousand years ago. But in these cases there is no complete preservation of the body. In the first place, the brain and other internal organs are removed before embalmment, and the rest of the body is preserved by a species of pickling, and subsequent treatment both internally and externally with spices and aromatic gums and resins, and finally enveloping it in fine linen bandages, scented and ornamented.

In our own day considerable success has been achieved in the attempt to preserve the body by injecting a preservative liquid into the bloodvessels, so that the finest of them are pervaded by it; one such substance is chloride of zinc dissolved in alcohol. However useful such a process may prove for anatomical purposes, for preserving temporarily with a view to identification, to enable a body to be removed long distances, instead of by the clumsy method resorted to in the case of the body of Lord Nelson, which is said to have been brought home in a cask of rum—I say however useful such expedients may be for special and temporary purposes, they never can completely preserve the natural appearance in such a degree as to produce an agreeable impression, or to remove the only natural sentiment of the surviving friend or relative, expressed in the words, “Bury the dead out of my sight.”

Whatever process of preservation be employed, it can never be satisfactory; it can never do more than retard and postpone the inevitable results—decay and destruction. Should the prevailing mode of burial in the ground ever be abandoned in favour of another method, it is most improbable that embalmment will be the one substituted.

Deep Sea Burial has been proposed in lieu of burial in the ground. The sea is the grave of thousands every year, and if at some future time, when population has enormously increased and land becomes scarce and unsuitable, a new mode of disposal of the dead be demanded, much might be said in favour of nations, especially maritime ones, resorting to the practice of deep sea burial. In the deep and wide ocean there would be a complete separation of the dead from the living, with the complete avoidance of the ill-effects produced by decomposition, a condition of immense advantage. Unseemly disturbance or desecration, such as too often occur in

land burial, would be at least impossible, while such a means of disposal might not be inappropriate to a people who have a liking for the sea, so many of whom spend a considerable part of their lives upon it, and a good number of whom lose their lives in it. As for most usages, so there is a precedent for this, for we read that "the Ichthyophagi, or fish-eating nations about Egypt, affected the sea for their grave, thereby declining visible corruption and restoring the debt of their bodies," as Sir Thomas Browne quaintly puts it. In other words, these people, having nourished and sustained their bodies by the eating of fish, render back their bodies after death as food for fish. Such a mode of disposal is really a form of exposure in which the body is consumed by fish instead of quadrupeds, birds, etc.

It would not be difficult, of course, to find objections to this mode of disposal; sentimental objections would be sure to take a prominent place, as they do, indeed, in relation to any and every mode of disposal of the dead, and even if there were no difficulties connected with the transport of the body both by land and sea there would remain the objection which, in my estimation, is made too much of, that where death may have taken place under suspicious circumstances, such as physical violence or poisoning, the body would be irrecoverable for the purposes of judicial examination. With this contingency, however, I propose dealing presently.

We now come to the prevailing mode of disposal—viz., *Interment, Inhumation, or Earth Burial*. This is probably the most ancient as well as the most common method, and under all circumstances doubtless the most generally convenient, but it by no means necessarily follows that it is therefore the best; indeed, looked at from an æsthetic, a sanitary, or even an economical point of view, I can come to no other conclusion than that it is the worst of all. As long as populations are sparse and suitable ground is plentiful, the evils of earth burial are comparatively small. It is when cities grow large and densely populated that its disadvantages become apparent, and that its danger to the living is recognised. This danger had become so great that the Government, in 1843, instituted a special inquiry into the practice of interment in towns, which was entrusted to Mr. Edwin Chadwick, and since then there have been one or two other investigations into the condition of churchyards and burial-grounds, with the result that Acts of Parliament have been passed prohibiting intramural interment, with certain modifications and reservations. The present generation cannot realize the filthy and disgusting conditions under which interments in crowded city churchyards were made sixty or seventy

years ago. We have many privileges now which were not enjoyed by our fathers, but we fail to appreciate them because we are unable to realize them. The present outcry on the part of a few ill-informed and fanatical faddists against vaccination is an illustration of a similar kind; the present generation is so utterly ignorant of the horrors of uncontrolled small-pox that they fail to realize them, and in their ignorance are foolish enough even to deny their existence. It is so important, however, that we should take a correct view of the condition of badly-managed burial-grounds that I will cite you a few extracts from Government reports. In the Report of the Commission in 1849, composed of Southwood Smith, Chadwick, Sutherland, and others, they say: "We shall be under the necessity of making statements of a very painful nature, and sometimes of representing scenes which we feel most reluctant publicly to exhibit, but we should ill discharge the duty entrusted to us if we were to shrink from the full disclosure of the truth. We may safely rest the sanitary part of the case on the single fact that the placing of the dead body in a grave and covering it with a few feet of earth does not prevent the gases generated by decomposition, together with putrescent matters which they hold in suspension, from permeating the surrounding *soil* and escaping into the *air* above and the *water* beneath."

The slightest inspection, says Dr. Lyon Playfair, "shows that the putrid gases evolved from bodies are not thoroughly absorbed by the layer of earth above them. I know," he says, "several churchyards from which most fœtid smells are evolved, and gases with similar odour are emitted from the sides of sewers passing in the vicinity of churchyards, although they may be more than 30 feet from them." I can add my own testimony to the above statement. The ground near some of our own Birmingham churchyards was found to be blackened by the same agency. The filth was traced in one instance to its discharge into a neighbouring sewer, and a public well near another churchyard was so polluted that it became necessary to close it, which was done on my own representation.

The condition of many churchyards was described by the Commission referred to as revolting in the extreme, but I will content myself with quoting the description of a single case. It is the evidence of one who must be regarded as an excellent authority, and was reported in the *Times* of March 5th, 1845. Reuben Boom, a gravedigger at Spafields, says: "I was in the employ of Mr. F. Green as gravedigger in 1837. Our mode of working the ground was not commencing at one end and working to the other, but digging wherever it was ordered, regardless whether the ground was full or

not. For instance, to dig a grave 7 feet deep at a particular spot I have often disturbed and mutilated seven or eight bodies—that is, I have severed heads, arms, legs, or whatever came in my way with a crowbar, pickaxe, chopper, and saw. Of the bodies, some were quite fresh, and some decomposed. I have had as much as one and a half hundredweight of human flesh on what we term the beefboard at the foot of the grave at one time. I have often put a rope round the neck of a corpse to drag it out of the coffin, fastening one end of the rope to a tombstone so as to keep the corpse upright to get the coffin from underneath to make room for the flesh of other bodies. The coffins were taken away and burnt with pieces of flesh adhering thereto. I have taken up half a ton of wood out of one grave because I had to take up two tiers of coffins, some of which were quite fresh, and we used to cut them up for struts used for shoring up the graves. We had as many as fifty or sixty sides of coffins always in use to keep the ground from falling in when digging. We have buried as many as forty-five bodies in one day besides stillborns. I and Tom Smith kept an account one year; we buried 2,017 bodies besides stillborns, which are generally enclosed in deal coffins. We have taken them up when they have been in the ground only two days, and used them to light fires with. I have been up to my knees in human flesh by jumping on the bodies so as to cram them in the least possible space at the bottom of the graves in which fresh bodies were afterwards placed. We covered over the flesh at the bottom by a small layer of mould. I have ruptured myself in dragging a heavy corpse out of a coffin. It was a very heavy one. It slipped from my hold, lifting it by the shoulders. The corpse was quite fresh. These occurrences took place every day.”

Here is ample evidence, then, of the revolting character of interments in crowded graveyards, of pollution of the soil we live on and in, the water we drink, and the air we breathe. If proof be required of the injurious influence of these conditions it is too easily found; *e.g.*, “Cholera was unusually prevalent in the immediate neighbourhood of London graveyards.” “In the year 1841 two gravediggers perished in descending into a grave in St. Botolph’s Churchyard, Aldgate,” and it would be easy, if time permitted, to adduce any number of similar instances.

Since the Burial Acts were passed cemeteries outside of, and at considerable distance from, populous centres have been established. These provide better soil, more space, and more decent accommodation, and more sanitary conditions, but such provision is enormously expensive; much valuable land is taken from profitable

cultivation or other use, and as a rule it will be available for only a certain number of years. These cemeteries will in no very long time become filled, and probably before that time they will, owing to the extension of towns, be themselves surrounded by houses, and be as truly intramural as the burial-grounds they superseded. The difficulty of disposal of the dead is not removed by such provision, it is only staved off for a time; it must necessarily force itself upon public attention at ever-shortening intervals, so that as population continually increases at a more rapid pace some method must be adopted for the more sanitary, more economical, and more decent disposal of the dead.

Having referred to the various modes of dealing with the dead, excepting that of cremation, it may be well before passing on to its consideration to consider what changes take place in the body after death. We shall find that the one inevitable result of all the modes of treatment of a body, whether in air, water, or earth, is resolution of its complex material into a few simple substances useful in the great economy of Nature, where nothing is ever lost but only changed in form, and everything is made by a fixed law to assume, Proteus-like, varied shapes, but always in a definite order. There is a constant circulation of matter from the mineral through the vegetable to the animal world, and back again to the mineral, to start again on its never-ending round. The earth and air nourish the plant, the plant feeds the animal, the animal dies and resolves itself into compounds, which, returning to the air and the earth, are furnished again to the plant, and so on to infinity. The main substances into which animal matter resolves itself under all circumstances, with trifling modifications, are carbonic acid, water, and ammonia, all of which are gaseous and volatile, and mineral matter, containing iron, lime, magnesia, potash, phosphorus, sulphur, etc. The latter are solid, and constitute the *ashes*. These substances are the outcome of the resolution of the body, whether it be brought about moderately quickly by exposure to the air, or with extreme slowness, as in the process of embalming, in variable periods by burial, or with great rapidity by burning. It is only a question of time; the ultimate products are practically the same, whether the process occupy a period of minutes or thousands of years.

Such being the facts, we are bound by the dictates of common-sense, and as sanitarians by considerations of health, to choose that method of disposal of the dead which shall prove least injurious to the living. This must necessarily be the main object, for the dead, having no possible interest in the question, need not be considered,

whereas with an ignorance, a prejudice, or a superstition, which ought to be impossible in this age of vaunted intelligence, enlightenment, and practical wisdom, we employ chiefly the one method which has least to recommend it and most to condemn it.

You will conclude from what I have said that I give preference to the method of cremation, or resolution by burning, and I will now proceed to describe the method and to give reasons for my preference.

As there is said to be "nothing new under the sun," so there is nothing new in the application of cremation to the disposal of the dead, though there is very much that is new and improved in the details of the process. The method is, indeed, one of great antiquity, so that it is the more surprising that it should be as much objected to by some persons as if it were now proposed for the first time, for the strongest objection in some minds to any proposition or action is that there is no precedent for it. This objection certainly does not hold here, for there is ample evidence of its practice among the Jews, Trojans, Greeks, Romans, Carthaginians, Celts, Germans, Gauls, Danes, Swedes, Norwegians, and even Ancient Britons; while in modern times the practice of cremation is well known to exist among the Hindoos in India, and to be preferred frequently by Buddhists of different countries. Not very many years ago the ceremony of cremation in India was marred by the cruel custom of allowing or even encouraging widows to undergo voluntary cremation on the funeral piles of their dead husbands. This practice, called the "suttee," has been prohibited by the Government.

The recent endeavour to resuscitate the practice of cremation dates from only about thirty or forty years back, and originated principally in Italy. Gorini and Polli separately published the results of their experiments in 1872, and Brunetti of Padua, in 1873, gave his experience, and exhibited the ashes resulting from a cremation and a model of his furnace at the Vienna exhibition. His first cremation was performed in 1869, and two more in 1870 in an open furnace. In 1874 there was one in Breslau and another at Dresden of an English lady.

In the same year the Cremation Society of England was formed for the purpose of disseminating information on the subject and adopting the best mode of performing the process, provided that the act was not contrary to the law. Dr. Henry Thompson was elected president, and has held the office continuously up to the present time. Members were required to make the following declaration: "We disapprove the present custom of burying the dead, and desire to substitute some mode which shall rapidly resolve the body into

its component elements by a process which cannot offend the living and shall render the remains absolutely innocuous. Until some better method is devised, we desire to adopt that usually known as cremation."

This movement, begun in 1874, had many obstacles to contend with—not only public prejudice, which would have presented little difficulty, but ecclesiastical and governmental obstacles. The Bishop of Rochester refused his sanction to the use of a cemetery in the north of London, although an arrangement had been made with the directors; and the Home Secretary met the society's proposals with opposition when they had in 1879 erected a crematorium in Woking cemetery perfectly suited to its purpose. For subsequent experience proved that the perfect combustion of a human body was completed in about an hour, leaving nothing but a pure white ash weighing about five or six pounds, and absolutely devoid of odour. During the process neither smoke nor effluvia escaped from the chimney, the process and the result being equally unobjectionable.

The cremation is effected in a furnace of special construction but of varying form, the principle, however, being the same in all—that is, to effect complete incineration as quickly as possible, without effluvia, smoke, noise, or contamination of the ashes by any foreign matter. Siemens' regenerative furnace has been experimentally used in England—once in Birmingham in the case of an animal, under the supervision of Sir Henry Thompson himself. The same furnace has been employed for the cremation of human bodies in Dresden and other parts of Germany. At Woking, where the first crematorium in England was erected, the Gorini furnace is in use, while in Manchester and Hull they use a furnace of the regenerative type designed by the late Mr. Henry Simon, President of the Manchester Cremation Society. Described in the briefest possible manner, it consists of three interior chambers, the two lower of which are surrounded by air-passages. The lower chamber contains a coke fire, and the upper one is that in which cremation takes place. The fire is lit some hours before the apparatus is to be used, and is supplied with air in the usual way. By the time the apparatus is ready for use the walls of the air-passages are thoroughly heated. Most of the direct air-supply is then cut off, and the partially consumed gas (carbonic oxide) from the coke is allowed to mix in the second (or middle) chamber with the air heated by passing through the side air-passages. The incinerating chamber is thus filled with gas of an intensely oxidizing character in a state of incandescence. The degree of heat can be regulated

in the most exact manner. The temperature attained is about 1,800° or 2,000° F.—about the melting-point of silver. There is no smoke and little visible flame before the body is introduced, and if the coffin is made in accordance with the directions there is equally no smoke and no noise during cremation. The process occupies about one hour, at the end of which there remain only the inorganic bases of the bones. This residue is in the form of silvery-gray pumice-like fragments. It is removed by passing an asbestos brush through the chamber, which causes the remains to fall through an opening into the urn which is to receive them, and they are not otherwise handled in any way.

It should be explained that the interior of the cremating chamber is at no time visible to mourners. The coffin, when brought into the chapel, is placed upon a catafalque. When the committal sentence in the religious service is reached, it passes noiselessly, by means of an invisible mechanical arrangement, through curtains into an intermediate chamber, and the curtains fall behind the coffin before it enters the cremating chamber.

In 1880 Sir Spencer Wells brought the subject before the Cambridge meeting of the British Medical Association. The meeting memorialized the Secretary of State for permission to use the crematory; but though the opinions of such a body must naturally possess great value, the memorial was not successful.

In 1884 a Bill was brought into Parliament by Dr. Cameron "to provide for the regulation of cremation and other modes of disposal of the dead." The Bill included the following excellent proposals:

1. No burial to be legal unless medically certified. The importance of this proposal is seen when it is known that out of a little over 500,000 deaths in 1885 nearly 28,000, or 5 per cent., were certified only after inquest, while over 18,000, or 3·5 per cent., were buried without medical certificates or any inquiry whatever.

2. No crematory to be used until approved and licensed by the Secretary of State.

3. No body to be burned except at a licensed place in accordance with regulations made by the Secretary of State.

4. Two medical certificates to be required in the case of cremation, and if the cause of death cannot be certified an inquest to be held.

Though the Bill was seconded by Dr. Farquharson, M.P. for Aberdeen, and most ably supported by Dr. Lyon Playfair, it was opposed by the Government and the Leader of the Opposition, and so was lost by 70 votes in a House of 228.

Just before the introduction of this Bill a singular circumstance occurred which enabled the Council of the Cremation Society to commence operations at Woking. An eccentric old medical man, having at least the courage of his opinions, submitted the body of a child five months old, whose death he did not register, to an improvised cremation by placing it in a ten-gallon cask of petroleum in the open country and setting the petroleum on fire. He was tried for the offence, with the result that Mr. Justice Stephen delivered judgment to the effect that cremation is a legal procedure provided it be effected without nuisance to others. Thus the legal obstacle was removed, and, as far as I believe, only one apparently valid objection remains to cremation, and that is the possibility of its being instrumental in preventing the detection of criminal poisoning. The society, recognising this objection, issued a paper stating the conditions to be complied with before granting the use of the crematorium, viz. :

1. A certificate by the medical man attending the case till death stating that the cause of death was natural.

2. An application in writing by the friends or executors of the deceased—unless made by the deceased during life—stating the wish of the deceased to be cremated.

3. A certificate by the medical man attending the case till death stating that the cause of death was natural and what the cause was, and a certificate from another medical man, if possible a resident in the immediate neighbourhood of the deceased, after examining the facts, to the effect that to the best of his belief the death was natural.

4. If no medical man attended the case an autopsy must be made by a medical officer appointed by the society, unless an inquest has been held.

These precautions render the defeat of justice almost impossible, and might be supplemented where any taint of suspicion existed by the retention of the stomach and any other internal organs carefully preserved in glass vessels properly sealed.

It must be clear to any impartial person that with the above precautions, instead of the danger of non-detection of criminal poisoning being increased, it would be enormously diminished, or as nearly as humanly possible entirely removed. In the first place, it must be remembered that criminal poisoning is comparatively rare, and that 3·5 per cent. of all dead bodies are now buried without either death certificate or inquiry of any sort. Surely the greatest risk of foul play escaping observation must occur in this 3·5 per cent. of uncertified deaths ; but by the proposed method every death would

be certified after due investigation, so that under the improved system the security against poisoning would be vastly increased, if not rendered as perfect as possible. Thus the one objection commonly raised against cremation falls to the ground, it positively has no force, while it has the contingent advantage of showing how great is the danger of the modes of registration of deaths and disposal of the dead as at present conducted.

The sanitary advantages of cremation are so evident that it seems labour in vain to argue for them, but I must refer to a most powerful plea in its favour which rests on some original observations of Pasteur and Darwin. In 1837 Darwin proved that in old pasture land every particle of the superficial layer of earth overlying different kinds of subsoil has passed through the intestines of earth-worms. It is a well-known fact that worms swallow earth in order to extract from it their food, which being done, they eject the earth in little coiled cylinders, which everyone has seen on the surface of the ground, the lawn, or the soil of the tree-pot at the point where they have emerged from the soil. In dry weather the worms descend to a considerable depth, where they feed, and, coming to the surface, eject the earthy residue.

Darwin proved by actual observation that in fifteen years more than 3 inches depth of this earthy worm-mould had accumulated on the surface, and in another instance that a bed of marl had been covered in eighty years with this mould to a depth of 13 inches.

The scientific interest of these observations is very great, though probably at the time they were not expected to have any practical value. It is generally found, however, that such careful studies of Nature ultimately result in practical advantage, and the present instance is another illustration of it.

A disease very fatal to cattle, called "charbon" and "anthrax," had broken out and become seriously epizootic in France, so that M. Pasteur, who has done so much for the elucidation of obscure pathological questions, was commissioned to investigate it. He showed that the worm-mould on the surface of the ground in which carcasses of the diseased animals had been buried contained the specific germs which propagate the disease; that the same specific germs existed within the intestines of the worms, and that the spores or germs resist putrefaction for many years, lying dormant like a seed, ready to grow under favourable circumstances and communicate the specific disease. In a field where the carcase of a dead cow (charbon) had been buried two years before at a depth of 7 feet, the surface earth not having been disturbed since, Pasteur

found that the mould contained germs which, introduced by inoculation into a guinea-pig, produced charbon and death; that if a worm be taken from an infected spot it is found that the earth in its intestines contains these germs of the disease, which, on inoculation, propagate it in animals. The mould, when dried into dust, may be blown over the herbage on which the cattle feed, and may thus spread the disease. Pasteur suggests that in cemeteries it is very possible that germs capable of propagating specific diseases of different kinds quite harmless to the earthworm may be carried to the surface of the soil ready to cause disease. The practical inferences in favour of cremation are so strong that in Pasteur's words they "need not be enforced."

Mr. Councillor Holder, M.R.C.S., of Hull, who is chairman of the burial committee of the Corporation, and to whose exertions the provision of the Hull Crematorium is principally due, in his interesting little book, entitled "*Cremation versus Burial*," refers to the observations and experiments of Dr. Friere, a Brazilian physician, who in 1883 showed that yellow fever was dependent on a micro-organism which can be cultivated. He took some soil about a foot from the surface, and above the grave of a person who had died about a year before from yellow fever. In it he found millions of the microbes, the cultivation of which injected into guinea-pigs produced yellow fever in them.

"Dr. Aitken gives evidence of an army corps in India which was seized with cholera when camping on a piece of ground which subsequently was found to have been the site of a cholera camp ten years before, and on which probably no human foot had since trod." Moreover, Dr. Koch has proved that the bacillus of cholera can flourish luxuriantly on earth.

Sir Henry Thompson, an earnest and able advocate of cremation, especially from a sanitary point of view, and the one especially interesting to us, following up Pasteur's views, says: "The poisons of scarlet fever, typhoid, small-pox, diphtheria, malignant cholera, are undoubtedly transmissible through earth from the buried body by more than one mode. And thus by the act of interment we literally sow broadcast through the land innumerable seeds of pestilence, germs which long retain their vitality, many of them destined at some future time to fructify in premature death and ruined health for thousands. It is vain," he says, "to dream of wiping out the reproach to our civilization which the presence and power of these diseases in our midst assuredly constitute by any precaution or treatment while effective machinery for their reproduction is in constant daily action. The proportion of deaths due

to these diseases is exceedingly large ; they form no necessary part of the human heritage, they are all preventable, and are destined to disappear like the medieval scourges whenever man has thoroughly made up his mind to deal with them seriously." Dr. Thompson urges that at least the bodies of persons who have died of these particular diseases should be submitted to cremation, whether the practice be applied generally or not.

No one after consideration can doubt that cremation is the most sanitary mode of disposal, and it is the most economical, for it would liberate thousands of acres of land for food production, for building, for parks, or other useful purposes, and from the decency and purity of the process it is the least revolting to the feelings of the loving and mourning survivors. It offends no system of theology, and it literally verifies the words of our Burial Service, "Ashes to ashes"; it permits the possession or appropriate disposal of the remains, which are practically imperishable, in a suitable manner in urns which could be placed in crypt, cloister, church, chapel, columbarium, country churchyard, or private grounds without the slightest risk to the living. As old Sir Thomas Browne quaintly observes in his "Hydriotaphia," "He that hath the ashes of his friend hath an everlasting treasure." It would allow our dismal and neglected burial-grounds being converted into beautiful and healthy gardens. It is no dearer than ordinary burial, and is as free from social, scientific, and true sentimental objections as it is from religious ones.

It is true that one of the greatest obstacles to the adoption of cremation has been the Christian religion. The Pope promulgated a decree in which he stated that cremation was a detestable abuse, and it was not lawful for any Roman Catholic to leave orders for cremation.

The Roman Catholic objections were given some years ago by Cardinal Vaughan. They were as follows :

1. *It is a revival of a pagan system.* Is not burial also a pagan system ?

2. *It is anti-Christian and anti-Biblical.* Which it is not, for the Bible records several instances of cremation, notably that of Saul and his sons, of King Asa, and others.

3. *Earth burial was consecrated in a most special manner in the person of Christ, and therefore the Roman Church looked upon interment as the true Christian mode of burial.* As a fact, Christ was not interred: He was entombed; therefore, to be consistent, entombment should be insisted on. Cremation affords a safe and easy means of entombment.

4. *If the body were "annihilated" by cremation, faith in the doctrine of the Resurrection would grow weaker and weaker, and would eventually disappear.* This argument was supported by the late Bishop Wordsworth, also by the present Bishop of Chichester, who has said: "Cremation appeared to ignore one of the most fundamental articles of the Christian faith—the Resurrection of the Body." The reply is, There is no such thing as annihilation (of matter), and if there were it would be effected as much, if not so rapidly, by burial as by cremation. The late Lord Shaftesbury, in reply to Bishop Wordsworth, said: "What an audacious limitation of the power of the Almighty! What has become of the blessed martyrs who were burned at the stake?"

It is very satisfactory to find that objections on religious grounds are gradually disappearing under the light of education, and that cremation is now supported by the clergy and ministers of all denominations, many of whom are numbered among its promoters.

Another and still greater obstacle to cremation is sentiment, the better name for which in most cases, perhaps, would be prejudice. How can sentiment in connection with burial come into account when the horrible and disgusting character of putrefaction in the grave is realized, or when we reflect on the condition of things found to exist in the old City churchyards to which I have referred? In the grave we have corruption going on for scores of years, while in the crematorium we have complete purification by fire in as many minutes. Surely sentiment is much more worthily evoked by cremation than by burial, and there is good reason to believe that this view will in time be accepted.

The method is gradually winning its way to popular favour, as shown by the considerable number of crematoria which have been established in the last few years—viz., at Woking in 1885, Manchester in 1892, Glasgow in 1895, Liverpool in 1896, Hull in 1901, Darlington in 1901, and Leicester in 1902. There is one in course of construction in Birmingham, and another will shortly be established near London. On the Continent they were adopted much earlier; in Italy there are twenty-seven, in Germany seven, in France two, Switzerland two, Denmark and Sweden three, Japan one, United States of America twenty-six, and several are proposed in Australia, New Zealand, and South Africa. The number of cremations in foreign countries up to the year 1900 is, for France, 2,245; Germany, 4,261; Sweden, 721; Switzerland, 719; Italy, 4,110; and the United States of America, 13,281.

I saw the method in operation in the cemetery of Père la Chaise in 1889 (I think), where a crematorium had been established by the

Municipal Council of Paris. I was allowed to get glimpses of the incineration of the bodies of two men who had died of small-pox. The operation was most complete, causing neither smoke nor smell.

The largest number of cremations in England has been performed at Woking, where the first of the English crematoria was established. The number up to the end of 1901 was 2,097—at Manchester, 570; Liverpool, 150; Glasgow, 93; Hull, 17; Darlington, 2.

On looking at the names of persons cremated, one cannot fail to notice that they are those of the higher classes and educated persons, many of great note, embracing the aristocracy, the Services, the professions, especially medical men, philosophers, authors, scientists, and including a few of the clergy.

The facts I have adduced must, I think, constrain us to admit that this method of disposal of the dead body is in every respect the best. Thousands of thinking persons have come to this conclusion. The process has been declared legal on the highest authority; in certain towns powers have been obtained by public companies by special Act to establish crematoria. Among municipalities Hull led the way in obtaining Parliamentary powers, others were following, and now the Cremation Bill, which is at present before Parliament, and has passed both Houses, is only awaiting the Royal Assent to become an Act. The object of the Bill is to enable local authorities to erect crematoria without the trouble and expense of obtaining a special Act of Parliament, and to provide that wherever a crematorium is established it shall be properly equipped and carefully regulated and inspected by the inspectors of the Home Department.

In conclusion, some of the advantages of the method may be stated as follows:

Its rapidity and the obviation of putrefaction, with the resulting pollution of air, water, or earth, and the prevention of the spread of infection.

Dispensation with large and costly cemeteries, and the waste of land.

It enables a return to the practice of interment in churches without danger or offensiveness, such as occurred when it was customary to inter corpses there.

It prevents the possibility of being buried alive, the mere idea of which is a source of the most painful apprehension to some persons.

It interferes with no religious rite or ceremony, and, as the Bishop of Manchester observed, "No intelligent faith can suppose that any Christian doctrine is affected by the *manner* in which, or the *time* in which, this mortal body of ours crumbles into dust."

The Select Committee of the House of Commons on Death Certification reported that "there is little probability that cases of crime would escape detection."

Finally, the cost of cremation is moderate, and will diminish with its wider adoption and as the arrangements for it are made easy.

I believe that as the advantages of cremation become understood popular prejudice will be overcome, sentiment will be no longer misdirected, and therefore offended by it, and it will become more and more widely made use of. I have no doubt that the medical profession generally will give it their support, and that, above all, every medical officer of health will on all grounds, especially on that of promoting the public health, assist in making it popular by both his personal and professional advocacy.

STATISTICAL INQUIRY.—A committee has been appointed by the Council of the Royal Statistical Society for the purpose of inquiry into the production and consumption of meat and milk in the United Kingdom. One very important side of this inquiry is that which involves the collection of statistics as to the consumption of these articles of food by private householders, and the committee will be glad to receive offers of assistance in this respect. The committee is particularly anxious to secure a very large preponderance of returns from the labouring classes and small consumers. Forms for the purpose may be obtained from the secretary of the Royal Statistical Society, 9, Adelphi Terrace, London, W.C.

PORT SANITARY AUTHORITIES.—The annual meeting of the Association of Port Sanitary Authorities was held at Southampton in August. Alderman Fraser (Hull) presided, and delegates were present from London, Liverpool, Dover, Cardiff, West Hartlepool, Gateshead, Goole, and elsewhere. A letter was read from the Local Government Board with regard to an application by the association asking the Board to receive a deputation as to the necessity for the issue of regulations under the Public Health Act, 1896, with regard to vessels infected or suspected to be infected with small-pox, and with regard to persons thereon, and the issue of an order giving power to port sanitary authorities to adopt the Infectious Diseases (Prevention) Act, 1880. The subject of the first suggestion, the Board stated, was receiving their consideration. The Board could not arrange to receive a deputation at the present moment, but they would consider any special representations which the Association of Port Sanitary Authorities might wish to make in support of their proposal. Discussions took place on the recent outbreak of cholera in Egypt, the responsibilities of port sanitary authorities, and the inspection and accommodation of emigrants at ports. Alderman Fraser was unanimously reappointed president, and it was decided to hold the next annual meeting at Liverpool.