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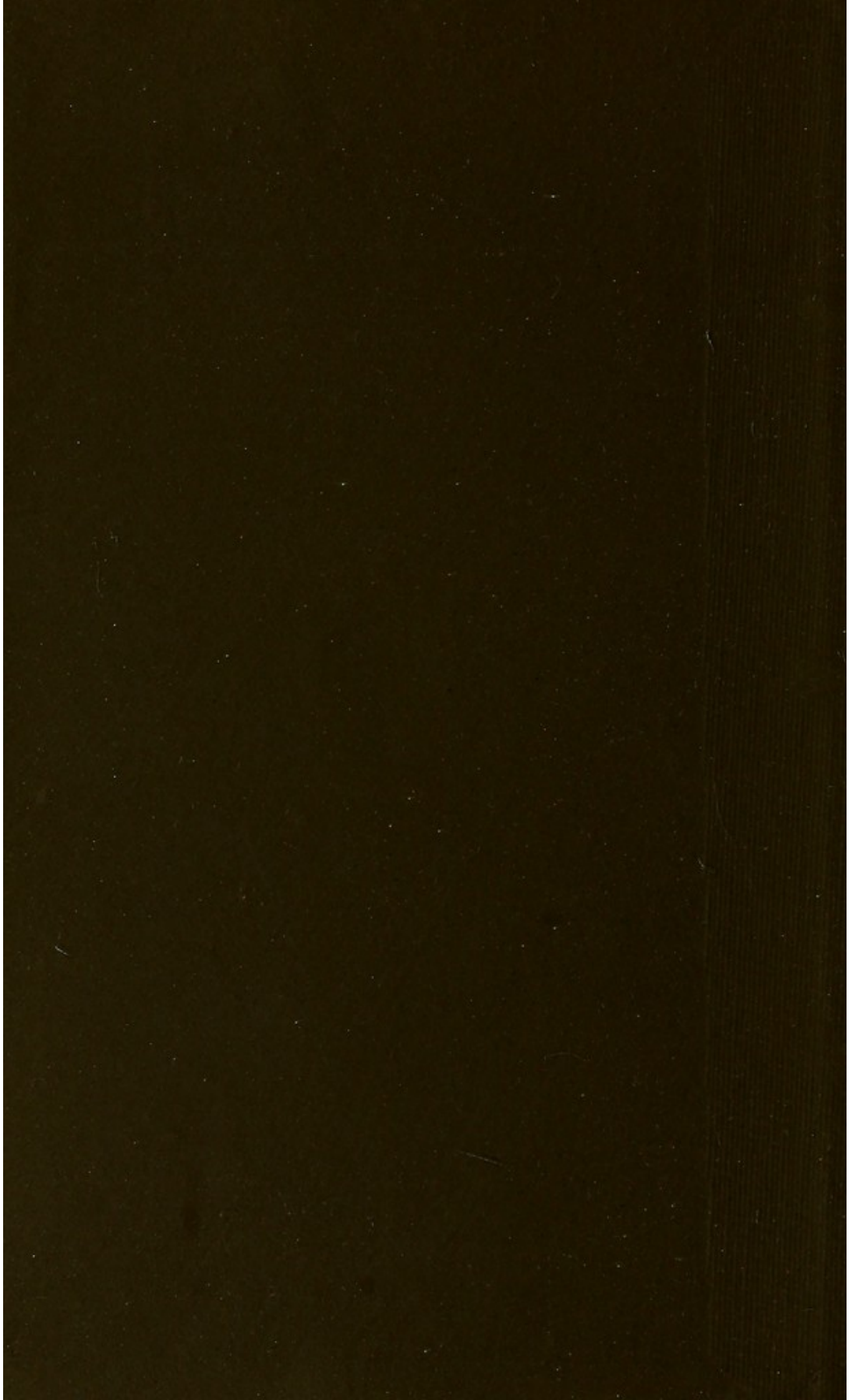
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CREMATION OF THE DEAD



W. EASSIE



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James R. Chadwick

CREMATION OF THE DEAD

CREMATION OF THE DEAD

ITS HISTORY

AND

BEARINGS UPON PUBLIC HEALTH

BY

WILLIAM EASSIE, C.E.

FELLOW OF THE LINNEAN AND GEOLOGICAL SOCIETIES

MEMBER OF THE ANTHROPOLOGICAL INSTITUTE

ETC.

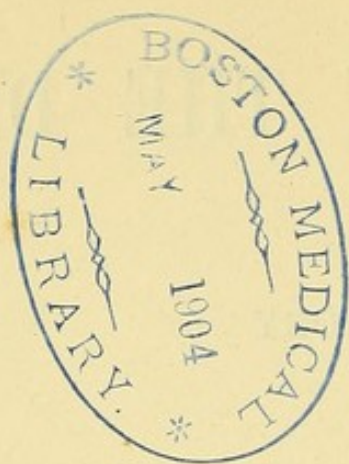
WITH ILLUSTRATIONS

LONDON

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1875

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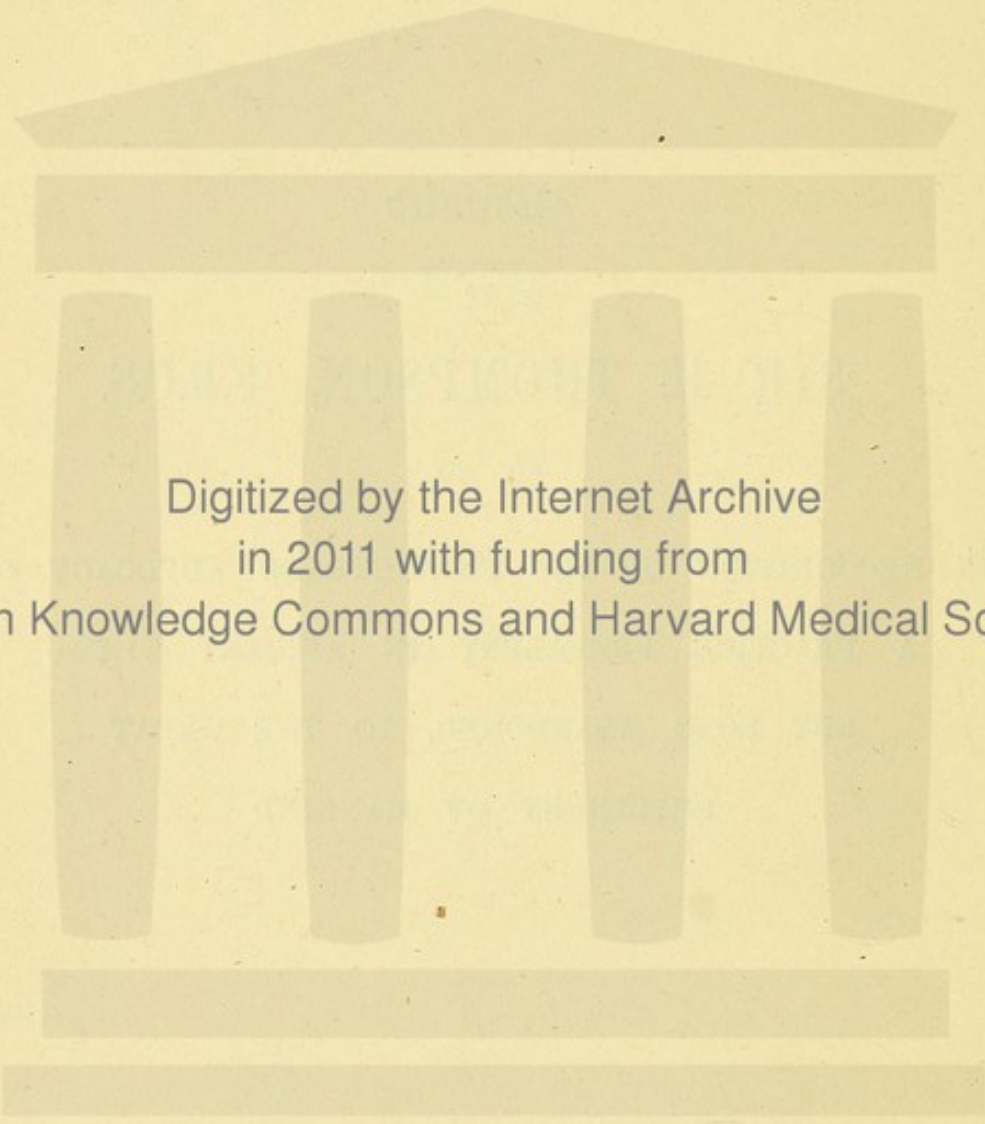
Dedicated

TO

SIR H. THOMPSON, F.R.C.S.

ETC. ETC.

IN RECOGNITION OF HIS ENLIGHTENED ADVOCACY OF
A PRACTICE PREVALENT IN ANCIENT TIMES,
BUT LONG ABANDONED, TO THE GREAT
DETRIMENT OF MANKIND



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PREFACE.

SHORTLY AFTER having accepted, from the members of the Council of the Cremation Society of London, the office of Secretary, a wish was expressed to me by the President of the Metropolitan Branch of the British Medical Association, that I should prepare a paper upon the Bearings of Cremation upon Public Health. A short paper, with this title, was therefore read, and was afterwards published in the Journal of the Association by the Editor, Mr. Ernest Hart. It was so favourably received by all, that I have been induced to extend my enquiries and so render the work, if possible, more acceptable as an exposition of the subject. I am sensible of its many defects, but I trust that it will be found to furnish some useful information which cannot well be obtained elsewhere, besides proving an assistance to those who are desirous of studying the question more fully.

WILLIAM EASSIE.

CHILD'S HILL, LONDON, N.W.

December, 1874.

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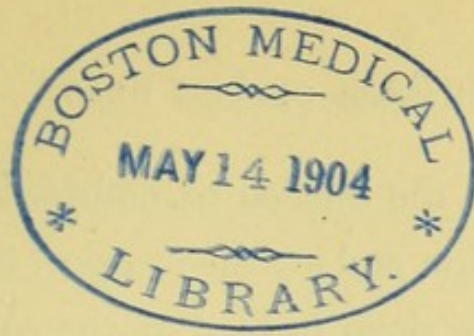
ILLUSTRATIONS.

(All at end of book.)



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- I. VIEW OF A SIEMENS' APPARATUS (GERMAN PATTERN).
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- III. SKETCH OF MORTUARY CHAPEL.
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CREMATION OF THE DEAD.

CHAPTER I.

INTRODUCTION.

CREMATION of the dead is neither new in theory nor in practice. In the England of modern times, however, the question has only recently assumed recognised importance. And the more one considers cremation, the more one finds himself wondering how it has come to pass that we practise burial, with its many faults, and do not burn our dead. Thousands amongst us are now beginning to feel thankful that the dead are soon to 'rule our spirits from their urns' in a realistic and not alone in a poetical sense. They think there is something majestic and even pleasurable in the idea that it will ere long be possible, on all civilised shores, to leave their mother earth, not with a partial, but with a fully consummated sacrifice upon her altar, bidding her adieu none the worse, but rather the better, for their sojourn with her. They groan

and labour under the burden of enforced burial, and 'hail with satisfaction and joy the prospect that a chariot of fire may receive them instead of the cold and darksome grave.'

The scheme has met with some enemies, and injudicious promoters of the system have not proved the least of them. The idea that it was sought to make it compulsory, was an unfortunate utterance. The notion of producing illuminating gas for general purposes from the combustion of the bodies was another mischievous idea.¹ Equally so was the proposal for the erection of a tall shaft in the cemetery grounds, where the gases could be seen consuming—something after the fashion, I suppose, of the twelfth century's *lanternes des morts*. The publication of crude and undigested fancies does more harm than good to the subject they are meant to benefit.

It has been urged that the practice of burning the dead had its origin in a heathen religion, but it is not wise to accept the imputation. Let us take Greece for an example. All historians inform us that the people of ancient Greece practised inhumation. But when they did practise cremation, they nowhere associated the burning of the dead with the worship of the gods. And we are at liberty to argue from

¹ The original proposer of this scheme was M. Rudler, who proposed it to Dr. Caffé, of Paris, in 1857.

this fact that neither did the aboriginal peoples from whom they derived it, regard it as an act with which religion had ought to do, the story of Odin notwithstanding. And the reason why the Greeks did not practise it earlier, was doubtless simply because the bulk of the colonists came from countries where another system prevailed. Cecrops and Danaus, who were instrumental in colonising Athens and Argos, were Egyptians, and Cadmus, the founder of Thebes in Bœotia, was a Phœnician.¹ Neither of these nations burnt their dead, but practised another system of burial.

There can, I think, be little doubt that the burning of the dead was originally resorted to upon sanitary grounds, and as a means of protecting the living from the effects of corruption. Putridity was observed to be loathsome and dangerous, and it was found that the practice of burning, and that only, at once resolved the body into its first elements. In Scandinavia, the dead were disposed of by fire from the earliest recorded times, and the great antiquity of the custom amongst the Celtæ, Sarmatians, and neighbouring nations, has never been doubted.² It was practised in our islands also in pre-historic times.

Cremation was the prevailing custom from remote ages in Scythia, or what is now called Tartary, and we are free to believe that its origin was similarly

¹ Jamieson.

² *Ibid.*

a hygienic one. The Scythians were the progenitors of the Thracians, and we read that these latter observed incineration from the earliest date.¹ The Thracians in their turn introduced the practice amongst the Greeks, although it is possible that a portion of the Hellenes learnt it from the Phrygians, who again very probably obtained it from India. The Greeks, too, evidently adopted it from motives of sanitary reform ; at all events, there was no religious question involved in it. About 1500 B.C., the Greeks invariably buried their dead ;² they had not learnt the valuable lesson. They do not seem to have burned them either in the ninth century before Christ, for the Institutes of Lycurgus specify the manner in which burial was to be performed. In the time of Socrates, however, 500 B.C., cremation appears to have become optional, for Plato makes Socrates say that he did not care whether he was burned or buried. It was, however, common enough about 100 B.C. ; I myself have dug up on the site of Dardanus relics of this kind of sepulture. Time rolled on, and in their turn the Romans, who also originally inhumed,³ borrowed the salutary practice, performing it first inside the city, and then extramurally. It did not become general in Rome, however, until towards the close of the Republic. Towards the end of the fourth century

¹ Herodotus.

² Cicero.

³ Pliny.

it became much neglected, and finally the Christians, inimical to the practice, although it was nowhere forbidden in the New Testament, made haste to abolish it in Europe. Burial and burning appear to have been practised contemporaneously for some little time, on our own Yorkshire wolds for example,¹ but ultimately the former triumphed.

I have said that the process of burning the dead is nowhere specially forbidden in the New Testament, and neither is it in the older Scriptures. Moses nowhere legislates against it, and it is reasonable to suppose that he must have heard of it, having been a considerable traveller. The early Jews are said to have objected to burning because they held the idea that the soul holds more or less intercourse with the body for a year after death. That the ancient race held this notion is corroborated by the 'dwelling among tombs and enquiring of spirits.'² The Hebrews were also said to have interred in caves or tombs—from Abraham down to Joseph of Arimathea—from a fear of premature interment, since the sun was not allowed to go down twice upon the unburied dead. It is more reasonable to suppose that the motive of public health was the correct one. Possibly they might have burned their dead also—as in nearly all originally well-wooded countries—if they had been

¹ Canon Greenwell.

² Jamieson.

possessed of fuel.¹ This was a drawback, and from what I have seen of Palestine, I doubt whether at any time sufficient fuel could have been found for everyday use in this way. When visited by a pestilence, however, the Rabbis admit that fires were kept burning in the valley of Tophet to consume the dead.² This was apparently a universal custom. When Homer hinted that the frequency of the kindling of the funeral pyres was owing to the contagion sent by Apollo, he alluded to the practice.³ And without doubt cremation was the proper treatment at such times, and would spare the horrid sights witnessed when large common graves are dug. Interments of this class are never free from danger. Instances are known where these communal graves have been opened up and the disease of the dead sufferers once more let loose upon the living.

Fortunately for sanitary science, cases are upon record where a disturbance of the interred victims of infectious epidemics has been followed by a fresh outbreak, and thus we are fairly warned of the danger. In 1828, Professor Bianchi explained how the dire reappearance of the plague at Modena was due to an excavation made in some ground where, 300 years

¹ Cremation is not opposed to Jewish doctrines.—'Jewish Chronicle,' April 10, 1874.

² Frazer.

³ 'Iliad.'

previously, the victims of the plague had been interred. At Eyam, in Derbyshire, remarks Mr. Cooper,¹ the digging up of the plague burial-grounds caused an immediate outbreak of disease. Mr. Cooper also describes how the excavations made for sewers in the site where the victims of the plague of 1665 were buried, enhanced the virulence of the cholera which visited London during the year 1854. Mr. Simon had previously warned the authorities of what would result from any disturbance of the spot.² Dr. Playfair also declares that the fever prevalent in Rome is due to the exhalations from the soil, which is saturated with organic matter.

In 1843, when the parish church of Minchinhampton was rebuilding, the soil of the burial-ground, or what was superfluous, was disposed of for manure, and deposited in many of the neighbouring gardens. The result was that the town was nearly decimated. I have lately made personal inquiries upon the spot, and find that the mischief which resulted has been even understated. The outbreak of the plague in Egypt in 1823 has also been traced to the opening of a disused burial-ground at Kelioub, fourteen miles from Cairo. Two thousand perished in the village, and

¹ 'On the Causes of some Epidemics.' Glasgow, 1874.

² 'The plague-pit,' says the 'Lancet' of September 16, 1854, 'is situated within the area bounded by Argyll Place, King Street, Tyler Street, Little Marlborough Street being directly over the pit.'

Cairo suffered fearful mortality. The outbreak of plague from this cause is also vouched for by M. Pariset, who was sent to Egypt by the French Government to inquire into the cause of the plague. Even the exhalations of a single corpse buried twelve years have been known to engender a dangerous disease in a whole convent.¹

I think it may be accepted as proven that the burning of the dead was of purely sanitary origin, and that it is erroneous to consider it a religious one. It became identified with heathen worship, because then everything was heathen. In Italy, the Abbé Bucellati, of Pavia, deprecates the idea that cremation can in any way be considered heretical; at the most, says he, it can only be called a rash project. The Rev. Mr. Long, of Zurich, for his part, insists that religion has no title to mix itself up with the question. The subject is essentially one of health, and will so remain. We may almost say that so prominently did the practice bring forth the idea of purification in the minds of its original observers, that several semi-religious mystifications were born of it. Thus the body was supposed by some to be unclean after the soul had left it, and that fire alone could purify it. Others held that by burning the body the

¹ H. W. Hemsworth.

soul was finally loosed from the clay, and cleansed from the contaminations which it contracted in the flesh.

In order to arrive at a correct idea of all the modes of sepulture followed out in this country since the islands were first populated, it would be necessary to consult almost an endless variety of archæological, ethnological, and anthropological works. Professor Rolleston has, however, lately reprinted a paper of his, upon the methods of 'Sepulture observable in late Romano-British and early Anglo-Saxon times, in this country,' and it deals with as much of the question as answers the present purpose. He shows that burning of the dead was not resorted to by the early Christians of England, and he quotes Mr. Kemble to the effect that all Anglo-Saxon burials without cremation in England are Christian. This says nothing for or against the desirability of the reintroduction of cremation amongst us. The question, however, is a curious and interesting one, and all would doubtless wish to know whether or not the examples of cremation already recorded from fifteen counties in England are all heathen. When some of the graves were opened they were found to contain fragments of charcoal, but that again must not be necessarily taken as an evidence of cremation. It was but the other day that a wooden bowl full of

charcoal was found in the tomb of Leonardo da Vinci. In the middle ages it was common to place a vessel full of ashes on the pillow of a dying Christian and to bury it with him; and the practices would seem identical. The reason for finding 'shards, flints, and pebbles' in the later and possibly Christian graves has also led to some curious discussion. It is inferred that it was probably allowed in earlier Christian times, and only discarded about the time of Shakespeare.¹ The whole controversy must be left in the hands of those who, like Professor Rolleston, are prosecuting researches into the early methods of burial, and who have opportunities and attainments for coming to a right and final conclusion.

It would be supremely foolish to object to the burning of the dead on the score of its being completely a heathen practice, and as if burial in the ground was not at one time open to the same objection. Not only so, but the battle between torch and spade was fought out in early times as now.

A writer of the second century admits that many of the Gentiles disapproved of cremation on the score of the cruelty which it did to the body, which did not deserve such penal treatment.² This is exactly what some are declaring now. An exclamation is even to be found in an old Greek poet asking

¹ Rolleston.

² Tertullian.

Prometheus to take back the fire which he had procured them.¹ Just as now a few Christians are contesting the propriety of burning the dead upon any consideration whatever, so the heathens were disputing the like question before the advent of Christianity. Heraclitus advocated burning—Thales and Hippon burial. Up to this day the Persian fire-worshippers will have naught to do with cremation because they regard it as a profanation of their deity. Nay, peoples are still disputing in countries which are painted in pagan black upon our missionary maps, and where Christians as yet have no footing. In Japan, the Shinto sect practises burial, the Monto sect cremation.² In Madras Presidency the votaries of Vishnu are burned, and those of Siva are buried in the common way. Amongst the hill tribes of North Aracan one tribe buries its dead in graves dug in the villages, the adjacent one burns its dead after the fashion of the neighbouring Burmese.³ And to quote one more example, some tribes of the Miao-Tsi—who are all of them zealous Buddhists—burn their dead, whilst others do not.⁴

People are every now and then solemnly informed that it is unadvisable to practise cremation because it is supposed to militate against a belief in the resurrec-

¹ Jamieson.

³ St. A. St. John.

² 'Lancet.'

⁴ Rev. J. Edkins.

tion.¹ But the ancient Romans, as has been explained by his Grace the Bishop of Manchester, believed in the immortality of the soul, which is a collateral idea, and *they* practised the burning of the dead. They did not believe in the resurrection of their present bodies, it is true, neither do many now.² The truth, on examination, however, appears to be that the early Christians objected to it because it was practised by the pagans, and because it was necessary to draw a strong barrier line between the two faiths. The ostensible objection which they found to burning was that their bodies had been redeemed and renewed in God's image. They taught that it was unlawful to burn the dead, because the penalty of fire had been remitted. The body was to be buried, and was thus held to be in readiness for the last trump. They did not believe that it was impossible to raise up the martyrs which were even then burnt, but they were not to burn. The breach between the two faiths was not at first an utter one, however. The Christians interred in the same places

¹ The Earl of Shaftesbury once remarked to an eminent promoter of the present cremation movement, with regard to this very prevalent and erroneous notion, that it was altogether unreasonable. 'What,' said he, 'would in such a case become of the blessed martyrs?'

² 'I presume that it has been shown beyond doubt that the material particles which make up our bodies are in a constant state of flux, the entire physical nature being changed every seven years; so that if all the particles which once entered into the structure of a man of fourscore were reassembled, they would suffice to make seven or eight bodies.'—Rev. A. K. H. B.

as the heathens, and even painted and engraved upon the catacombs representations of the heathen gods and goddesses.¹ The breach, however, widened, and then came the more Christian emblems of wreaths of flowers, angels, and children. Later on in succession came the Good Shepherd, the cross, the crucifixion scene, and so on,² gradually leading up to the skull and cross-bones of the last century. By this time the Christians heard of burning with horror. But a classical reaction set in about the time of Pope and Dryden, and now again may be seen in every church-yard the broken shaft, the inverted torches, and other emblems. It would also be fairly impossible to count the number of marble urns which 'in pride of place' rest upon the monuments in our cemeteries.

Many other groundless objections have been imported into the cremation question. For instance, some demur to burning because the body of our Saviour was not so treated. Can anything be more puerile than this when once it is examined? Our Saviour's body was not burnt simply because HE was a Jew, and the Jews practised burial in sepulchres. HE performed several of HIS greatest miracles owing to this very practice. But if we are to follow the prototype so closely, why do we practise burial in the earth? And why do we not lay our dead in roomy sepulchres?

¹ Dean Stanley.

² *Ibid.*

I have perused most, if not all, of the religious objections which have been urged against cremation, and I humbly say that they appear to me to be outside the pale of argument altogether. They rank only as very respectable crotchets, and never rise above mere sentiment. The truth is, that the question of burying the dead or of burning them ought never to have been made, if ever it has seriously been made, a religious question. As professing Christians we should take the advice of a late writer, and take care that the burning of the dead does not fall into altogether infidel hands, and so become at last a symbol of irreligion.¹ It would be wise also to commence adding to the Hymnals² compositions which would suit the new and more rational order of things, and so prepare the weaker brethren for what one cannot help calling the inevitable.

¹ I. O. in 'Church Review.'

² Cremation has already been made the subject of verse upon the Continent. Dr. Moretti, of Cannero, in the 'Annali di Chimica,' 1872, has given to the world some excellent verses; and Professor Polizzi, in a poem published at Girgenti, 1873, and dedicated to the memory of Dr. Salsi, has also eloquently apostrophised the subject. Some two-and-twenty stanzas in the Milanese dialect were published in 1874, by Civelli of Milan. I have also seen some German verses, signed 'Dranmor,' and a short but charming poem in the same language by Justinus Kerner. It is a matter of regret that those of our own poets who have been in favour of burning the dead did not enshrine their proclivities in verse. Southey, for instance, wrote that the custom of interment 'makes the idea of a dead friend more unpleasant. We think of the grave, corruption, and worms: burning would be better.' But he left us no poetry on the subject.

Cremation has been objected to¹ on the score of its being an indecent mode of disposal of our dead, but I for one differ from this view entirely. Anyone who resides on a main road leading to a large metropolitan cemetery, will be able to speak with certainty as to the indecency of very much which they witness appertaining to the present mode of sepulture. And how anyone can be found to uphold against all argument the present unfeeling shams of paid mourners with 'wands, batons, feathers, and fooleries,' indulged in simply from custom's sake and a dread of what the world would say if the 'conventional costumes and mock expressions of woe' were omitted, I cannot imagine. The funerals of the rich are always conducted with decorum, but those of the poor are often hideously the reverse of this, and tend, I am sure, more than anything to blunt the finer feelings of our nature.

We shall have occasion to notice in the proper place the proposed procedure in the new order of things, but may here remark that when cremation has once taken place, shorn of no religious rite, the ashes may be placed in urns or interred in ground duly set apart for the purpose, and surrounding the machinery

¹ It forms no part of my purpose to defend cremation against those who consider that its practice might lead to the commission of crime owing to the entire destruction of the body. This and other objections have been suitably dealt with in the work of Sir Henry Thompson.

for incineration. Or they may be removed to distant and loved churchyards without fear of evil effects following. I think that the likeliest place for the reception of the relics would be the vaults of our churches, where they could be taken charge of by the ministers of religion. Once in charge of appointed persons, no unseemly litigation could take place as to the possession of them. In Siam the ashes are sometimes buried in the grounds surrounding the temples, and a small pyramidal mound erected over them.¹ There could be no objection to treat them so here, but if urned they could be equally well placed in a columbarium,² and proper inscriptions put over the receptacles, as was done on the small stone sarcophagi of Italy. An English Catholic writes to the effect that cremation would once more enable us to bury our dead in the churches,³ and the suggestion would commend itself to many minds. Some such practice is hinted at in the book of Isaiah. On All Saints' day⁴ the vaults could be thrown open for public resort.

In both ancient Greece and Rome the dwelling-house was made the repository of the funeral urns; at all events, the practice was carried on for a very long

¹ Crawford.

² See Plate VI.

³ 'Building News,' April 18, 1874.

⁴ Or All Souls' day. Some most touching scenes are witnessed in continental cemeteries on this occasion, more particularly in France and North Germany.

period. The Thebans at one time had a law that no one should build a house without a specific repository for the dead.¹ It is possible that private mausoleums could with due decency be attached to ancestral mansions in our country,² but such cases will necessarily be rare. Even then they should be subjected to proper supervision. It would most certainly prove unseemly for the poorer classes to place them, as has been mooted, in their residences, subject to all the inconveniences of removal and other easily imagined drawbacks. Disrespect and irreverence only could follow such a recommendation. The Theban regulation just adverted to proves that the heathens, as they are called, were not to be charged with any lack of respect to their departed dead. On the contrary, the most tender sentiments are wound round the practice of cremation. Hercules is reported to have burnt the body of Argius, because only in this way could he return the son to a sorrowing father.³ Nay, in some cases the reverence for the dead became transcendental, and the rites of cremation were carried to such an extent that the funeral pile was shapen like an altar, and bedewed with wine and incense. This, however, was in the decadence of the nation. Nor was this all, for sometimes an altar called an *acerra* was afterwards built before the sepulchre.

¹ Potter.

² See Plate V.

³ Jamieson.

These few remarks upon the cremation of human bodies have as yet referred only to those which have succumbed to the ordinary evils of life ; but I cannot forbear recording my conviction that it would be wise in the stricken field to have recourse to the practice. During the sittings of the recent International Sanitary Congress a paper was read by Professor Reclam of Leipzig, in which he most strongly urged the adoption of cremation after destructive battles. He described a new portable burning apparatus capable of reducing the carcase of a horse to ashes within two hours, and at a cost of four shillings' worth of fuel. He moreover declared that the dead, both men and horses, left on the battlefield of Gravelotte might have been by the aid of such machinery reduced to 'a harmless heap of white ashes in four days.' One thing is certain : science, which invented the mitrailleuse, could easily devise a proper apparatus.¹

Combatants who have been slain, or who have perished through sickness, are buried as haste dictates, and often imperfectly. I saw, during the war, relics of the dead protrude from the Sebastopol trenches. The bodies at Metz were in many cases exhumed by the Germans and re-interred, because the superficial burial rendered them dangerous to adjoining tenements, and a source of contamination to watercourses. At Sedan

¹ Mr. Hemsworth has suggested an apparatus for the purpose.

the same thing occurred, only in this instance the dead bodies were consumed with pitch and straw.¹ Cremation is the only practice which seems commendable in times of warfare. Numerous dead Saracens were burnt by the King of Castile. During the wars between the English and the Burgundians and the French—the latter led by Joan of Arc—the dead were on one occasion piled up outside the city of Paris, and consumed in one huge pyre. After the late battle of Cuenca, the Carlists threw many of their dead into fires presumably lit for the purpose. Surely it would be well for sanitation's sake, that the slain were burnt, as in the olden times, upon days set apart by arrangement of neutrals. The Genevan and other Conventions could scarce find nobler work to inaugurate than this. It would be a wise repetition of history, should another great war unfortunately break out, if the combatants would adopt this salutary practice of 3,000 years ago. With the ancient Athenians, when soldiers fell in battle it was the custom to collect them into tents, where they lay for a few days, in order to ensure recognition. Each tribe then conveyed their dead in cypress shells to the *Ceramicos* or place of public burning; an empty hearse following behind in memory of the missing. It is not necessary, however, that the dead should be burned internation-

¹ Dr. Parkes, 'Practical Hygiene,' 4th edit. 1874.

ally. During the Trojan war—and since the discoveries of Dr. Schliemann we are almost at liberty to believe in it—men were sent out from each side to collect the dead, and the Trojans and allies burnt on separate pyres. There can be no doubt whatever that the dead were so treated. I have always considered that one or more of the huge earth tumuli on the plains of Troy, which I have frequently visited, would prove to cover ancient funeral pyres, and this point was put beyond all dispute by Mr. Frank Calvert in 1859. He opened up the Hanai-Tepeh tumulus there, and found an immensity of ashes, corresponding to what might have been expected after a great burning of the dead. He came to the conclusion that this was the site of the funeral pyre raised by the Trojans after the first truce.¹

Were cremation practised now-a-days in times of warfare, and with our improved appliances, there would be no costly monuments to be kept up by the invaders, such as we now jealously maintain on the heights of Sebastopol²—nothing be left behind

¹ 'J. Arch. Soc.' vol. xvi.

² The commissioners sent to report upon the state of the English graveyards in the year 1872 found no less than 130 cemeteries occupied by our dead. Forty-five of them contained no monuments, and 65 only headstones of the commonest kind. The French had gathered together some 28,000 of *their* dead, and formed one large *campo santo*. The English commission reported that it would require 5,000*l.* to put the graveyards in seemly order, and an annual expenditure of some 200*l.*

to recall a strife best forgotten. The ashes of our warrior dead could even be brought home to lie in the fatherland. When Nestor recommended the bodies of the slain Achæans to be burnt close to the ships, in order that the survivors might be able to carry home the bones, and raise over them a common tomb,¹ he proved himself much wiser than our generation.

The general adverse feeling to burning even the dead bodies of animals at the present day, has without doubt often brought about serious evils. During the Crimean war the putrefaction of numberless horses in and around the French camps became ultimately a serious matter,² and had they been destroyed by fire no evil effects could have followed. Why were they not destroyed by fire?—for fear of offending the prejudices of their allies? For one reads that in the battle of Paris, on March 30, 1814, 4,000 horses which were killed, were burnt twelve days afterwards. It is doubtful, too, whether or not the removal of diseased cattle from our midst by burial only, is sufficient to stamp out a very virulent plague. I find that during the great plague of 1865, in Great Britain alone 132,000 cattle were attacked; 17,368 of which more. It appears that the graves have been frequently rifled by the Tartar peasantry in search of rings and other valuables. See 'Daily Telegraph,' Oct. 30, 1874.

¹ 'Iliad.'

² Dr. Parkes.

were killed, and 81,368 of which died.¹ Had a few hecatombs been slain and burnt at the commencement of the visitation, or had the initial thousand of sickly ones been slain and consumed by fire in Russia, the steppe murrain would have been speedily stamped out.

In a similar manner should be treated the whole of the meat seized as unfit for food. In Gloucester, some years ago, and when the mayor had no power to fine the vendors of bad butchers' meat, the carcasses were, it is said, destroyed by fire outside the city wall. Would that such jurisdiction existed now! In the metropolis alone, thousands of tons of animal food are yearly condemned, to say nothing of fruit and vegetables. The State should burn these up with even more alacrity than contraband of custom. And the purification by fire might be even extended to the humblest things. It has been said that the lower animals which perish in our midst must perforce send thousands of pounds of mephitic vapour daily into the air, if left unburnt.² It is not necessary to enumerate what else it would be desirable to destroy in this way. They can be seen in nearly every river, canal, and pond, in every ditch, gutter, and even street.

¹ Gamgee on the 'Cattle Plague.'

² Frazer.

Medical men are the chief exponents of the good results which will follow the adoption of cremation, and with one exception the whole of the foreign writers upon the subject are professors of some branch of medical science. It is the same in our own country.¹

¹ The last public utterance was made by Dr. Wheelhouse, of Leeds, in his address of October in the present year. He says:—

‘Do we not shun, and that most wisely, the presence of those afflicted with infectious diseases so long as they remain amongst us; and yet, no sooner are they removed by death, than we are content, with tender sympathy indeed, and most loving care it is true (but with how much wisdom?), to lay them in the ground that they may slowly dissipate their terribly infectious gases through the soil, and saturating that, may thereby recharge the rains of heaven, as they filter through it, with all their virulence and terrible power of reproduction in the systems of the living. I am not the thorough and entire believer in the disinfecting and depurating power of the soil that I once was; for terrible examples of its failure have, in my judgment, come under my notice.

‘Sir Henry Thompson has lately sounded a note of alarm on this subject; and though, for the present, it may fall upon ears unheeding or unsympathetic, I yet venture to think that, in time to come, his warning will be enforced by stern necessity, and that some better method of disposing of our dead will take the place of the burial so honoured and revered by us.’

CHAPTER II.

METHODS OF TREATING THE DEAD.

It will be necessary for my purpose to give a short description of the chief modes of disposing of the dead, and to quote a very few examples of each practice. In instancing such examples, I will as much as possible confine myself to my note-books of the last four years, and by so doing the matter will not only be more likely to possess novelty, but it will have been based upon the late observations of our distinguished travellers and possess authenticity.

The first method of disposal which I will mention is Exposure, which might be better described as no burial at all. The Colchians and Phrygians at one time hung the dead bodies upon the limbs of trees,¹ and some of the Indians of the Plains of North America to the present day do little else, since they expose their dead, after a rude bandaging, upon platforms

¹ Frazer.

erected upon the top of tall poles. Many ancient nations, however, purposely exposed their dead to the predatory instinct of animals. For instance, the Syrcanians abandoned their dead to wild dogs.¹ The ancient Ethiopians threw their dead into the water, to be devoured by aquatic animals.² The Parsees, as far back as 400 B.C., and for an untraced time previously, exposed their deceased friends upon high gratings to feed birds of prey, and such 'towers of silence' are in use up to the present day. Dr. Aveling informs me that in India they are accustomed to carry the body to the top of a hill and place it upon a stone slab, returning for it in order to bury it when the bones are picked clean. Disturbances have frequently taken place of late between the Hindoos and Parsees owing to this practice, for the vultures and other birds often let fall portions of the body during their flight into the gardens of the former. And speaking still of our own times, the Hindoos often expose their dead by the banks of their sacred river to the attacks of the river monsters; some of them even, when fuel is scarce, cast the partly burnt body into the Hooghly. Some Kaffir tribes also remove the dead out of sight to spots in the bush, where they are devoured by wild beasts.³

Casting the body into the deep is another form

¹ Spondanus.

² Frazer.

³ 'Iron.'

of exposure, with the reservation that although it is understood to be in the nature of things that it will be devoured by the lower animals, this is not the primary motive. The practice is common with all maritime nations on the occurrence of deaths out at sea. Burial in the sea generally has, however, of late been recommended as a panacea for the ills seen to be consequent upon inhumation. One writer¹ pictures the 'dead ship' daily departing from the strand with its lifeless burden, and reverently and prayerfully committing the bodies to the bosom of the 'mystic main,' until the time when the sea shall give up its dead. But there is little to recommend the practice, even if the idea were not revolting to a people who exist largely upon fish and crustaceans. When a flight of locusts was some years ago swept by a storm into the Bay of Smyrna, many people there would not feed upon fish for a considerable time afterwards, and what would the feeling be if only the dwellers in our littoral towns and villages followed out burial in the sea? Even the *sinking* of the bodies with heavy weights down to the ocean's depths would be hazardous. The only people who appear to practise sea-burial are the aborigines of the Chatham Islands. When a fisherman there departs this life, they put a baited rod in his hand, and, after

¹ Veritz.

lashing him fast in a boat, send him adrift to sea.¹ But I need not further continue the subject,² and I think that it may be taken for granted, that sea-burial, or immarment, or immersion, or aquation, or whatever names the method may be known by, will never become general. The ancient Lacustrine dwellers did not practise water-burial, but disposed of their dead upon *terra firma*, evidently from motives that have already been explained.

A method of petrification has lately been broached, and has met with some adherents. Something is to be produced similar to a relic which I once saw for sale in Manchester, taken from a guano-bed about thirty years ago, and which had been interred in the phosphates about a hundred and fifty years previously. In a cave in the Bay of Nipea, a number of bodies were discovered which had been petrified by the waters of some springs. The latest mode of effecting this kind of sanitary preservation was practised upon the body of Mazzini; and the result was, I understand, very disappointing.

A system of inhumation analogous to that practised when stone-coffins were in use is now agitating

¹ Welch and Davis.

² Dr. Parkes, in the chapter upon the *Disposal of the Dead*, in 'Practical Hygiene,' evidently leans to the opinion that burial in the sea *might* suit maritime nations.

in Germany.¹ It is proposed to encrust the subject over with a cement, and, after placing it in a sarcophagus of similar artificial material, to pour more of the same matter in a fluid state around it, so that the dead would be entombed in a solid matrix of long-enduring material. But those who are practically acquainted with the nature of cements, or rather with the impossibility of resting assured that proper cements would always be used, will know that it is more than likely that, out of the 32,000 who are said to die annually per million, one-half of the bodies would be enveloped in an impoverished material, which would speedily fall to pieces, with disastrous results. Dr. Sedgwick has expressed himself as certain that even plaster of Paris would prove ineffective in preventing the exhalations from coffins. Supposing, too, that each of the defunct required a space of one cubic yard only, where could cemeteries be obtained which could afford permanently to alienate 32,000 cubic yards of space per million annually? The scheme carries wildness upon its very face. Something analogous to this system of burial was the strange one carried out by the ancient Peruvians. A late traveller² has described some of the Huacas, as the places were called, and the well-preserved remains of which are still to be seen. It was a system of piling up coffins of plaster in pyramid fashion, to such an

¹ Dr. von Steinbeis.

² Mr. H. J. Hutchinson.

extent that one of these pyramidal mounds measures over $14\frac{1}{2}$ millions of cubic feet. One carefully examined measured over $3\frac{1}{2}$ millions of cubic feet, and was one mass of half-mummified bodies. As fast as a death took place, a chamber of sun-dried material was prepared upon the mound, and the body laid in it; and although the material of which the mound was composed was little else than mud-plaster, these cellular-built Huacas possessed a wonderful power of resistance to decay. One of them, in 1854, had occasion during the war to accommodate a battery of artillery on its summit.

Many of the ancient peoples buried in caves. The primeval races frequently used the caverns once inhabited by the extinct beasts for this purpose.¹ The ancient Persians hewed out holes in the mountains with the same view. The early Arabians also hid their dead in caves, in order to protect them from wild beasts. Burial-caves of some ancient Russian peoples are found along the Borysthenes.² To this class of burial might also be said to belong all those tombs which were built up in chambers with rude pieces of stone, and whether afterwards heaped over with earth or not. A tomb of this latter description was the huge barrow of the Emperor Yung-Lo, with its extensive megalithic avenue leading to its centre, by

¹ Buckland.

² Frazer.

way of which the dead was visited or the tomb cleansed.¹ The stone lines on Dartmoor may have originally belonged to this category. Even at the present day the Inguishes of the Caucasus bury in vaults of masonry built above ground, with an aperture in the west side by which the corpse is introduced, and which is afterwards filled up with stones.²

We now approach *burial in the earth*, and the common practice of the present day. It is not needful, however, to say much here concerning it, as it will be treated of in a separate chapter, where its shortcomings will also be noted. The most persistent practisers of inhumation³ are the Chinese. They seem rarely to have followed any other system of burial. Long before the Christian era they used coffins, and previous to committing them to the ground inserted in them gold and silver valuables. But at that time they did not form grave-mounds or fence them round with extensive palisades.⁴ The secret of their attachment to burial in the earth lies in the fact that they believe that the body must rest comfortably in the grave, or misfortune will follow the family.⁵ The Chinese are therefore particularly anxious about the suitability of the burial site, and sometimes a priest is consulted and a fresh

¹ Lieut. Oliver.

² Howarth.

³ This word conveys the meaning of burial in the actual earth better perhaps than any other.

⁴ Wylie.

⁵ Dr. Eatwell.

interment made. This superstition has considerable disadvantages, because the dead not being interred in enclosed spaces, as with us, but at the fancy of the relatives, it is sometimes impossible to make roadways from place to place. They oppose tramways and railways for this reason, and riots with the Franks have already taken place in consequence. The Chinese never desecrate the graves of even foreign sailors, and have been known to inter cast-ashore bodies with the greatest attention. To wherever they themselves wander, and whether they die and are buried in California or in Australia, they are eventually re-interred in the Flowery Land, in the mortuary erections of the villages dear to them. It is therefore not uncommon to see a China-bound vessel from San Francisco well freighted with the bones of disinterred Celestials. On the hills in China the graves are often allowed to remain undisturbed for years, whilst in the low-lying districts the bones are gathered up as soon as possible.¹ There is no such thing there as a burying-ground or cemetery.

The treatment of the dead known as embalming was carried on by the ancient Egyptians from apparently the remotest times. They believed in the transmigration of souls, and their return in three thousand years to the same body ; hence the practice.

¹ Lockhart.

Long before the sumptuous mummy-pits were commenced by the later races, the system was in full observance. There have lately been exhibited¹ a bone necklace and two flint bracelets which were found in a very rude mummy-pit on the edge of the Plain of Thebes, and doubtless these represent the distant antiquity of Egypt. Flint instruments have also been found in mummy-cases.² The extent of country over which mummifying must have extended was enormous, if, as is urged,³ there was any kinship between the red races of Europe and America and the Egyptians—who all practised embalming in some shape or form—and as was supposed to be the case from the existence of pyramid building in all three countries.

Embalming has continued to meet with supporters in most civilised countries, but little practical result follows, for the opportunities of practising it are few and far between. Some literature exists on the subject, and a few treatises have been published upon it in our own country, notably one by Surgeon Greenhill in 1705. Mummifying preparations were, I find, patented by Orioli in 1859, by Morgan in 1863, by Audigier in 1864, and by Larnandes in 1866. Suggestions for a partial embalmment were also published in 1860 by Copping and in 1863 by Spicer. The filling of the

¹ By Mr. McCullum in 1873.

² Rossellini.

³ By Professor Gennarelli.

arterial and vascular systems with concentrated solutions was also proposed by Spear, Scollay, and by two Parisians, in the year 1867 ; and yet another patent was issued in 1868. But we may assume that an universal system of embalmment is undesirable in our times. There is no purpose to serve in withholding from nature her very own. Cases may be imagined in which the practice would be advisable ; but, as a rule, the earth's surface is required for the living, not for the dead ; and we have, at least here, no underground caves. Had the Egyptians lived in a damp climate such as ours, there would have been no embalming. It is not every country that is suited to the practice. The people of Etruria were, it is now supposed, Egyptian in descent, but they were content with images of mummies only. The failures we ourselves have met with, and which are to be seen in the Royal College of Surgeons Museum¹ and other places, are quite sufficient to disenchant anyone. The Egyptian authorities themselves eventually abolished the practice.² What would they have said if they had lived to see their revered dead and their sacred animals carted away and sold as a drug, or worse still, as a manure ? Professor Coletti has wisely remarked

¹ See the body of Mrs. Van Butchell, embalmed by Dr. Hunter and Mr. Carpenter in 1775.

² Walker.

that when a man passes over to the majority¹ he should speedily become 'a handful of simple earth and nothing more.'

There is a system of burial somewhat analogous to embalming, which consists of drying up the body, and then interring it. The ancient Peruvians used to dry their dead in the sun, and inter them in a sitting posture, bound in cotton cloth, the quantity of saltpetre in the ground completing the desiccation.² The Huacas or huge pyramidal burial mounds of these people, which were so constructed that each added body, with its funeral accessories, had its own clay-mortar enclosure, prove also that some rude attempt at embalmment was practised.³ To the present day races are discovered which possess some knowledge of the art. A tribe in South Australia practise the following system. They place the deceased in a sitting posture near the top of the hut, and keep up fires until the body is dry, when they proceed to bandage it. Eventually they hide it away amongst

¹ What a majority this must be, if the human skeleton from the Florida Reef is rightly estimated by Agassiz at 10,000 years old, the Egyptian relics from the Limant Bay borings by Rosière at 30,000, the remains from the New Orleans forest by Dowler at 50,000 years, and if the human bones found at the Illinois river, at Natchez, at Calaveras, at Anguilla Island, and in the Ashley river, are correctly stated by Schmidt, Dickeson, Whitney, Rijgersma, Holmes, Lubbock, and others, as contemporaneous with the mammoth and mastodon!

² Hutchinson.

³ Bradley.

the branches of trees.¹ In another remote part of the world, Japan, the Aino aboriginals, when a chief dies, lay the body out at the door of the hut, remove the viscera, and wash it daily in the sun for a whole year. When completely dried, the remains are put in a coffin and buried.² In India beyond the Ganges, the Looshais also practise a desiccation of the dead.³ And the manner in which the body of our noble traveller Dr. Livingstone was prepared previous to bringing him home, would seem to point to the prevalence of such a custom, or to the tradition of one, amongst the African races.

There remains now only cremation to notice, the origin of which practice is lost in obscurity. It would serve little purpose to compile a mere list of the countries in which it was practised. Sufficient now to say that nearly all the ancient peoples observed it, the Chinese and the Jews being notable exceptions to this rule. The ancient Germans burnt their dead ;⁴ so did the ancient Lithuanians—placing the ashes in urns of unburnt clay, and burying them in mounds, as is proved by an exploration of the great barrows near Sapolia in Russia.⁵ Over our own islands also, cremation seems to have been common. Urns are still unearthed from time to time in England, and in

¹ Hutchinson.

² St. John.

³ Dr. A. Campbell.

⁴ Tacitus.

⁵ Bogouschefsky.

parts of Ireland—one part of Antrim especially—the ground is almost studded with burial sites of this character. In Scotland, too, many similar remains have been discovered. In Hindoostan the system is all but universal, and in Siam, where the ashes are frequently placed in urns of great value,¹ it doubtless existed from the first peopling of the country. The people of Pegu and Laos also burn their dead;² and in Burmah, when a Buddhist priest of rank dies, the body is embalmed in honey, laid in state for a time, and then sometimes blown up with gunpowder together with its hearse.

Scarcely a year passes over our heads without adding to our list of cremation-practising peoples. Thus we have lately learnt that amongst the Gāro Hill tribes of Bengal, the dead are kept for four days and burnt at midnight within a few yards of their residences, the ashes being put into a hole in the ground dug upon the exact spot where the burning took place, and a small thatched building erected over the grave, which is afterwards allowed to fall to pieces.³ The Khāsi Hill tribes also practise cremation of the dead, and the ashes are collected in an urn, and temporarily buried close by, until it is deemed proper to remove them to the family depository of

¹ Crawford, &c.

² Feudge.

³ Elliot.

the tribe.¹ Some of the Aracan tribes of Further India also burn their dead, leaving at the place of cremation some packets of rice, a neglect of which custom is a bar to inheritance.² And not only from remote Asia do instances of cremation come before us, but from America, where the practice was little suspected. Thus the Cocopa Indians there practise it to the present day, laying the body upon logs of mezquite wood, burning it, with the effects of the deceased, and placing the ashes in urns with peculiar ceremonies.³ The Digger Indians also burn their dead, the nearest relative collecting the ashes and mixing with them the gum of a tree. This they smear on their heads in evident imitation, one would suppose, of the Israelites when in mourning.⁴ I could quote numerous other examples of the practice of burning the dead, tracing them satisfactorily, I have reason to think, to sanitary motives. Some of the systems observed, however, are excessively puzzling; for instance, the triple treatment of the Singpho people, who embalm, burn, and bury in rotation. The bodies are first of all dried in coffins made for the purpose, whereupon the mummy is burnt, the ashes being deposited in mounds, which last are eventually covered over with conical roofs.⁵

¹ Major Godwin-Austen.

² St. A. St. John.

³ Professor Le Conte.

⁴ Chapman.

⁵ Griffiths.

Many other strange matters connected with mortuary observances, incomprehensible I am afraid at present, would confront the student of burial customs. Why, for instance, should the Greeks who burnt their dead place in the tomb vases and other things esteemed by the deceased?¹ and why do we find the same practice in vogue as far off as Madagascar, where they do not burn their dead?² Why also should the Scythians of old have burnt the body, and also the chattels of the deceased?³ Why should the Patagonians of to-day bury the body and burn the chattels,⁴ and the Shan-doo tribes of Aracan, where cremation is common, burn neither and bury both?⁵ Or if these questions are easily answered, why, if not for sanitary reasons, should any people have gone to the trouble and expense of cremation, when exposure or burial in the earth was so easy to perform and absolutely costless?⁶

When the necessity for cremation has once become a settled conviction with a people, nothing but the pressure of a conquering race or religion inimical to the practice will eradicate it. In parts of Madras where fuel is dear, the body is reduced to ashes with dried cow-dung and wood. In Siam, if poverty

¹ Vitruvius.

² Dr. Oliver.

³ Herodotus.

⁴ Journal Anth. Inst.

⁵ St. A. St. John.

⁶ In ancient Greece, unteethed infants, suicides, and lightning-stricken people, were forbidden the *privileges* of cremation.

forbids immediate cremation, the body is first buried, and when the cost of the process can be borne, the body is disinterred and given to the purifying flame. Rather too than lose the benefits of cremation, when wood was scarce and when it was forbidden to cast the partly consumed bodies in the river, the poor people of Bengal, with, for that race, even avidity, are closing with the proposal of Sir Cecil Beadon to erect a Cinerator, and thus departing from their ancient traditional routine.¹ Not even the recurring cases of premature burning, such as that not long ago at Ramkistopore, can wean the Hindoos from the burning *ghat*. They will risk their lives in war time in order to collect fuel to bury a dead comrade.² In any country where cremation is practised, it is only when there is absolutely no property whatsoever that burning is omitted. For instance, a Zaisaugh amongst the Kalmucks, whose property will pay for a proper offering, can have his dead body burnt, and only the utterly poor are buried or abandoned.³ More than this, in order to establish apparently a proper regard for the practice, and preclude any laxity in its obser-

¹ The first devised cinerator was that of Col. Thos. Martin, and in it any number of bodies could be calcined at a time, and still allow of a separate collection of the ashes. This cinerator was in the shape of a pentagon, to accommodate the various castes, and had a separate place allotted to the Brahmins.

² 'Iron.'

³ Liadov.

vance, a sham burning is carried out by some peoples. Should, for example, a Khāsi Hill tribe man die whilst on a distant expedition, and his body not be recoverable, some cowries or shell money are burnt with the deceased man's clothes, and the ashes placed in the family repository.¹

There are several spurious kinds, or half-and-half schemes, of cremation. For instance, the Fresendajians place their dead in vases of aquafortis.² Caustic potash and other chemical substances have also been proposed for placing in the coffin.³ A quasi-burning—the burial of the bodies in quicklime—is also practised by the Sephardic Jews of Gibraltar and North Africa. Even recently, the Spanish and Portuguese Jews have made use of this system at the Mile End cemetery, London.⁴ During the Prussian occupation of Chalons, numbers of typhus-stricken dead were interred in this material, but the result was unsatisfactory.⁵ At York can be seen a casting inside which a Roman lady was so burned, but whether intentionally or not, it is impossible to say.

¹ Godwin-Austen.

² Frazer.

³ Professor P. Gorini, author of 'I vulcani sperimentali,' is said to have made some experiments in his laboratory at Lodi during the month of September 1873, with a liquid composition of which he preserves the secret, and which envelopes in flames and completely destroys without noise or odour whatever animal substance is immersed in it. But some doubts have been raised as to its practicability.

⁴ 'Jewish Chronicle.'

⁵ See p. 64.

CHAPTER III.

OUR BURIAL LAWS.

IN order to properly estimate the improved condition of things during the present day, and under the present regulations as to burial, it will be necessary to examine the state in which our graveyards were found before these new regulations were in force. Let us take, then, our metropolitan burying-places as they existed a little more than twenty years ago.

A very good idea of the lamentable want of proper space for burial in the metropolis in 1843 was furnished by Mr. Sopwith, who showed by a plan that the extent of intramural space then provided was just about half of what it ought to be, even at the standard of 110 burials per acre. At that time things were in a most desperate state, the burials at the parochial yards of St. Mary's-at-Hill, St. George's Burial Ground in Uxbridge Road, and St. Olave's, Tooley Street, averaging 1,204 per acre. The grounds belonging to other religionists were in some cases worse; for the interments in the Roman Catholic yards at Moorfields and Dockhead, in the Baptist ground at Woolwich and

in the Congregationalist fields at Stepney, averaged 1,278 per acre. But the parochial burial-grounds of St. Giles's, St. Pancras, and St. John's Chapel of Ease, exceeded the last-named figure by 282, and, horrible to relate in these days—when we calculate that, to properly accommodate even 52,000 annual metropolitan dead with decennially renewed interments, we should want at least 500 acres—the burials in the new Bunhill General Burial Ground reached the astounding figure of 2,323 per acre.

This was a fearful state of things, it must be admitted, but it was even exceeded in point of hideousness by many of the yards of our country towns, and even of our villages, where one might have supposed no necessity for overcrowding existed. The reader who is anxious to examine these revolting details for himself can see them in the reports of the evidence taken before the Parliamentary Commissions of 1842, of 1843, and of 1850. These reports were issued by Lords Carlisle and Ashley, and by Mr. Edwin Chadwick and Dr. Southwood Smith, and revealed horrors beyond all that could have been imagined. Nor were some of the villages of Switzerland better situated with regard to accommodation than our own. Read for instance the condition of the churchyard of Schuls, as described by Professor Reclam.¹

¹ In the 'Gartenlaube,' No. 19, 1874.

Since 1843, however, many of the parochial and general burial-grounds of the metropolis have been closed altogether, and the same has been done in many parts of the country. During the ten years which elapsed between 1852 and 1862, about 500 Orders in Council were issued, by means of which, says the great legal authority upon the laws of burial,¹ some four thousand old burial-grounds have been closed or regulated. Regulation generally means the forbidding of interments in a churchyard which has been reported against by the Medical Officer of Health, except in the case of family graves. A London churchyard has just been regulated in this way.² During the ten years alluded to, some 400 local burial boards were constituted. Within that period also nearly one and a half millions were raised for the use of the parochial cemeteries by the ratepayers.

Some cemeteries properly so called existed in 1843, but their area in the metropolitan districts amounted to only 260 acres, and the annual number of burials performed amounted to nearly 3,400. Of this number the burials in the East London, in the City of London and Tower Hamlets, and in the Kensal Green Cemeteries, made up over two-thirds. The number of

¹ Baker, 'Laws relating to Burial,' 4th ed. London: 1874. Mr. Baker was kind enough to read over the proof of this chapter.

² By Dr. Tripe.

burials per acre in the East London Cemetery, Mile End, was 154, in Kensal Green 17, and in Norwood 5. In 1850 the Board of Health condemned the cemetery at Brompton, but interments are still carried on there, with, it must be, anything but satisfactory results to the houses which surround it. What will it be twenty years hence, if the interments go on as now? Several new cemeteries have been opened, it is true, for instance a magnificent cemetery at Woking. Others again are being projected for places where interments have been found difficult to obtain, notably, one for the south of London. At the present moment a company is being formed to work a cemetery at East Ham, two miles nearer to the city than Ilford cemetery. As the site is upwards of two miles beyond the metropolitan area, no sanction is required from the Secretary of State, and yet it is adjacent to some very populous parishes, whence, as is set forth, numerous interments may be expected. The site occupies 115 acres, 45 of which it is purposed to reserve for burials, the other 70 to be sold in lots for building purposes. Then again come cemeteries of ease as they might be called, belonging to parochial boards whose churchyards are full. To this category belongs a burial-ground just commencing in a parish in the Northern suburbs of London, within 500 yards of a reservoir constructed since 1871 at a

cost of 25,000*l.* The formation is clay, and is easily drained into the main drainage system, but the fear is that at some future time the exhalations will affect the water in the reservoir, especially if it be uncovered. These two last examples will show how nearly omission may be made a non-transgression of a law.

Our burial laws specify that each dead adult shall be entitled to four superficial yards of earth. Allowing for the predominant deaths amongst children, this would be an average of three yards. This thirty-six superficial feet is about the space allowed to each body by the authorities of Stuttgart and Munich; but in Würtemberg fifty-four feet are accorded, and in some parts of Austria as much as ninety feet is awarded to each adult. The common practice with us is to allow about a quarter of an acre of burial-ground to each 1,000 head of population, where the soil is favourable; but some authorities double this allowance, and leave room for embellishing the ground. Wise cemetery companies also allow a space between each alternate row of grave-spaces, in order to prevent trampling. They, moreover, encourage the purchase of family freehold grave-plots containing three or six grave-spaces. It is true that the proprietors of the burial-ground profit by this payment in anticipation; but the benefit accrues largely to the public as well, for it does

not become necessary to open the same grave should two members of a family die with but a short interval of time between. For the rest, a commodious grave-space presupposes a sufficiency of soil to absorb the gases, allows the grave to be opened without the earth of the adjoining one falling into it, dispenses with the shoring up of the sides with planks, and provides sufficient space for suitable monuments. As a general rule, one-sixth of the entire acreage of a cemetery will also of a necessity be appropriated for roads and paths, for sites of lodges and chapels, and botanical groves.

The depth at which burial is practised varies much, but it is usually from eight to ten feet in soil propitious to decay. Six feet would suffice, it might be ; but, as the intention is to be able to reopen the graves fourteen years after the burial of an adult, and eight years after the burial of a child, a fair maximum depth is resorted to. When a burial has taken place in an allotment, the above period of lying fallow can only be shortened should it be necessary to open the grave to inter another member of the family. In such a case, a foot of earth must be interposed.¹ The law is also

¹ During an official enquiry held by Mr. Holland, in November 1874, into the management of the Tooting cemetery, it transpired that four or five inches of intervening earth had been deemed necessary by the inspector of the cemetery, instead of the twelve inches stipulated by law.

distinct on the point that no one shall be buried in any unwall'd grave within four feet of the ordinary level of the ground, unless it be a child, and then not less than three feet of soil shall lie above it.

When the coffin is not laid in contact with the soil, but entombed in a vault or walled grave, the occupied space is covered by a stone cemented down, air-tight, upon a ledge in the wall, and the raising of which is for ever forbidden. The entombment may also be made by an air-tight surrounding of concrete. The best practice of vault burial is to place some charcoal or disinfectant along with the coffin, so that no foul gas shall escape should reopening be necessary. When old vaults underneath churches are reported upon and found inimical to public health, the churchwardens can be compelled to remove the contents elsewhere, and disinfect the vaults, charging the poor-rates with the expenses. No interment is now allowed under any new place of worship, except with the authority of the Secretary of State. During the ten years, too, which followed the passing of the Burial Acts in 1852, more than one hundred church vaults in the metropolis were disinfected and sealed up.

Cemeteries, and not churchyards, are now the chosen sites for interments. These cemeteries are

In the case of private graves the coffins had been laid without any intervening earth at all.

permitted to be located upon any piece of ground, provided that the usual restrictions are not set at naught.¹ A well-chosen cemetery² is one whose soil is dry, close, and yet porous, permitting the rain and its accompanying air to reach a reasonable depth, and so expedite decay. The formation is also well covered with vegetable mould, which assists in neutralising any hurtful emanations and encourages the growth of shrubs. The subsoil is also of such a kind as to need no underdraining, and such as will prevent the water lodging in any grave or vault.³ It will also stand exposed to the north or north-east winds, which are dry, and which do not hold the putrefactive gases in solution, like the moist south or south-westerly winds.

Cemeteries can be made upon clay soils, if properly drained by deep cross-drains, and by pipe-drains laid from grave-space to grave-space, duly conducted into the main drain, or by causing the first interments to be made near the drain, strewing gravel at the bottom

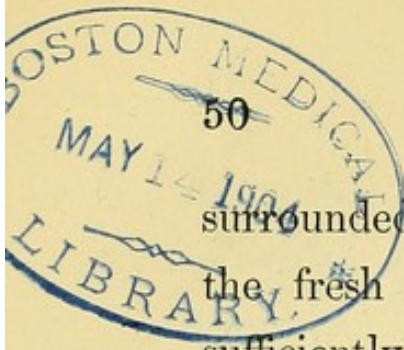
¹ The Congress of Hygiene at Brussels recommended an intervening space of 400 mètres between a cemetery and any habitation.

² The Greek word cemetery means a sleeping-place, and the idea of rest would be far better conveyed if only ashes were laid there, as no further atomical change would be possible.

³ In the Tooting cemetery enquiry, November 1874, it was proved that although the subsoil required draining, the merest surface drainage had been resorted to. The Burial Board admitted that in one instance a coffin had been deposited in a grave with water in it sufficient to cover it.

of each grave opened out, and similarly connecting with this porous layer each new grave with a previous one. When the soil does not admit percolation downwards, it is necessary to get rid of the surface water by laying a line of pipes at the upper end of each row of graves, and so intercepting it. Or upright pipes are placed, reaching down to the bottom of the grave and to the artificially placed gravel then communicating with the drain. The clayey soils of some burial-grounds have also been improved by the admixture of sand and gravel when refilling the graves. But, even after all this expense, the gases evolved during decay are retained very often in the soil, and, after thirty or more years, little or no change will have been effected. The laws of nature are thus contravened; for she has ordained that, in good soil, all but the larger bones shall disappear in twelve years. If interments be made in the worst of clays, sudden heat will open up fissures in the ground with lamentable results.

An improperly chosen graveyard, then, may be said to be one where the soil is dense and clayey, and impervious to moisture. It will be insufficiently drained, necessitating the use of planks to walk upon in wet weather. It will be too close to the abodes of the living, too small to permit proper planting, the graves covered, it may be, with flat stones, which prevent the passage downwards of the air and rain, and



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surrounded, moreover, by high walls which exclude the fresh air. The ground will be stony and insufficiently covered with vegetable soil. No natural outfall will exist, and the drainage-water must be pumped up, the bare idea of which is horrible. It will be near also to water-bearing strata, or to a reservoir. Long before decomposition has taken place, owing to the smallness of the site and the impossibility of obtaining any more land except at high building prices, the organic matter hidden out of sight will be far too large in proportion to the area. From the foregoing we may conclude that a proper site for a cemetery is not everywhere obtainable, and that serious mistakes must often be made.

The older burial-grounds can be closed at the expiration of a month's notice given by duly qualified persons, on the order of the Privy Council, and any one assisting at a burial contrary to that order is liable to fine and imprisonment.

The Ecclesiastical Commissioners can grant, in certain cases, a faculty permitting the erection of schools in churchyards, especially when the grounds have been closed under the Burials Act; and never shall I forget a school of this description in one of our largest cities. Old burial-grounds can be converted to more common secular purposes under certain restrictions, as may be witnessed almost every day in

London. In such cases the remains must be decorously removed to some consecrated ground, after due notice to the relatives. An example of this may be observed at the present moment at the demolished church of St. Antholin, London; only in this case the remains have not been carted away as usual to the City of London Cemetery at Ilford, but have been placed in a monster vault constructed at the base of the tower, which is the only part of the church that is to remain. In this vault have been placed over 200 chests, each containing the contents of a grave.

If the closed burial-ground be taken under the Land Clauses Act for public improvements, and converted into sites for building, the freeholder obtains the sum at which it was valued previously to the passing of the Act, and the building may proceed. In the City of London the Commissioners may, with the Bishop's consent, arrange with the churchwardens for the appropriation of any disused burial-ground. Sometimes, as in the case of the Bunhill Fields ground, the space may be laid out and preserved as an open space by a corporation, and a burial board may do the like with all ancient graveyards within their jurisdiction. The authorities, however, I believe, provide that, in burial-places so closed, vertical tombstones shall not be thrown down and made use of as a paving,

and, as a general rule, the growth of grass is encouraged for sanitary purposes.

I have given an account of the past and present state of the burial laws, because it was necessary to do so in order to estimate the position which any better system of dealing with our dead will occupy. It cannot be said that no pains have been taken to lessen the horrors of the tomb, for I have taken the trouble to make a list of the proposed improvements in the paraphernalia of death which have appeared¹ since 1781, and everything seems to have been considered. From 1781 to 1825 the main thing studied was security against the rifling of the grave; and then on to 1871 followed plans for all kinds of coffins in stone, marble, granite, slate, porcelain, earthenware, bitumen, asphalte, paper, peat, india-rubber, iron, and glass. Glass has been the favourite material, just as it was in old Italy, where it was mostly selected to enshrine the ashes collected from the pyre. It is melancholy to peruse these strivings after the impossible, and to see what fond but unavailing attempts have been made to rob inhumation of its terrors.

¹ Patent Office Records.

CHAPTER IV.

DANGERS OF OUR SYSTEM OF BURIAL.

IN order to form a comprehensive idea of the salutary benefits which will accrue from a general observance of cremation, or even from a limited adoption of the scheme—which, by the way, is nowhere forbidden by the statutes of the land—it will be necessary to review cursorily the positive evils for which past inhumation is answerable. I will therefore attempt to point out from carefully collected and other authentic sources, chiefly from the reports of the Parliamentary Commissioners, how the dead have poisoned and still poison the living.

It seems to be generally admitted that the foetid air exhaled from the dead is fatal if breathed in a concentrated state, and that, even when dissipated by the wind, it lowers the vital powers of the community.¹

¹ 'The decomposition of bodies gives rise to a very large amount of carbonic acid. Ammonia and an offensive putrid vapour are also given off. The air of most cemeteries is richer in carbonic acid (.7 to .9 per thousand—Ramon de Luna), and the organic matter is perceptibly large when tested by potassium permanganate.'—Dr. Parkes, 'Practical Hygiene,' 4th edit. 1873.

Cases of instant death to grave-diggers, notably to three in Paris in September 1852, from accidentally inhaling the concentrated miasma which escapes from coffins, have been recorded. Slower deaths from exposure to the same evil, through what is designated low fever, are very common. Undertakers have given evidence to the effect that they have suffered from faintness and nausea, even when they have not been cognisant of any offensive odour.

Dr. Riecke reported that putrid emanations 'operate in two ways, one set of effects being produced through the lungs by impurity of air from the mixture of irrespirable gases, the other set through the olfactory nerves by powerful, penetrating, and offensive smells.' Dr. Southwood Smith says that, when present in the atmosphere, morbid animal matter is 'conveyed into the system through the thin and delicate walls of the air-vesicles of the lungs in the act of respiration,' and instances how the vapour of turpentine, if only inhaled when walking through a recently painted room, will exhibit 'its effects in some of the fluid excretions of the body even more rapidly than if it had been taken into the stomach.'

So with the vapour which arises from an overcrowded and even from any churchyard. People who are accustomed to reside near badly regulated graveyards are mostly unable to detect the serious nuisance

by the sense of smell ; but medical men, accustomed to the dissecting-room, can recognise it directly, and can even distinguish it from the foul odours arising from sewers. In a case at Manchester, where a main sewer ran through the graveyard, the graves drained into it, and the smell of the dead came into the houses through the untrapped sinks. Mr. Roe stated on oath that he once traced exudation from a churchyard in St. Pancras parish into the road-sewer thirty feet distant, and that this would have resulted even if the sewer had been cemented or concreted over. These cases will prove that there are more sources of danger than from surface-emanations. The rule seems to be that, where the graveyards and roads are paved, and the stones laid horizontally, the escape of the deleterious matter is either into the wells or sewers. If, as in many instances, the surface of the burial-ground be above that of the street, the loathsome matter may even be seen trickling down the walls of enclosure. Some most sickening cases were published in 1851 in the report issued by the General Board of Health.

If the formation of a deep sewer will suffice to drain dry all the wells near its line of march, then the sinking of a well near a burial-ground must help to drain the latter. There is a complication when drains in the neighbourhood of graveyards are tide-

locked at intervals; and an instance of this was given by Dr. Reid, who stated that careful examination of the air in the Houses of Parliament, thirty years ago, resulted in the discovery that it was very much vitiated, both by night and by day, from their proximity to St. Margaret's burial-ground.

The disorders commonly complained of in the neighbourhood of burial-grounds are headaches, diarrhœa, and ulcerated sore throats. According to a report of the French Academy of Medicine, the putrid emanations of Père-la-Chaise, Montmartre, and Montparnasse, have caused frightful diseases of the throat and lungs, to which numbers of both sexes fall victims every year. 'Thus a dreadful throat disease which baffles the skill of our most experienced medical men, and which carries off its victims in a few hours, is traced to the absorption of vitiated air into the windpipe, and has been observed to rage with the greatest violence in those quarters situated nearest to cemeteries.' An officer once stated to Mr. Chadwick, that when a building looking over a certain Liverpool churchyard was used as a barracks, he and his men always suffered from dysentery. It was related by Messrs. Houlier and Fernel that, during the prevalence of the plague in Paris in the beginning of the eighteenth century, 'the disease lingered longest in the neighbourhood of the *Cimetière de*

la Trinité, and that there the greatest number had fallen a sacrifice.' In such desperate plight also were the houses which abutted upon the churchyard of St. Innocent, that the vapour was *seen* to rise from the soil, and the stench was unbearable. It is on record, too, that, when a large common grave, fifty feet deep, was dug in the same cemetery in the following year, candles would not burn in the cellars of the adjacent houses, and those who only approached their apertures were immediately seized with alarming attacks. The walls of the cellars streamed down also with an offensive moisture. Numerous other instances might here be quoted.

It was proposed by M. Fourcroy to analyse the foul gases evolved from bodies which had been interred in this oversaturated soil; but no grave-digger would venture to assist in its collection, because it resulted in almost sudden death if inhaled in the concentrated form near the body, and even at a distance, 'when diluted and diffused through the atmosphere, produced depression of the nervous system and an entire disorder of its functions.' As a rule, the grave-diggers there had a cadaverous appearance and all the other signs of slow poisoning. M. Patissier also noticed several cases where death resulted from digging the graves. Doubts have been expressed as to the baneful effect of putrid emanations

upon grave-diggers; but, as Mr. Chadwick has observed, if a number of these men be compared with a number of men following healthier occupations, it will be found that the mephitic influences entail a loss of at least one-third of the natural duration of life and working ability. As a rule, none but the healthiest and most robust men choose this trade, and they drink very freely, in order to overcome the nervous depression caused by unhealthy emanations, live on stimulating foods, and work but for a few hours per day.

Professor Parkes has described and named the offensive gases and putrid vapours given off by churchyards.¹ Professor Pettenkofer has also proved the presence of carbonic acid gas in the ground-air under houses, and the effects produced by this pulse-lowering gas. Dr. Reid examined at Manchester some graves which had been dug some hours previously, and found that it was necessary to have recourse to mechanical or chemical ventilation before the men could descend into them. The carbonic acid gas simply flowed into these deeply dug graves from the porous surrounding soil, like so much water. In the same way also this poisonous gas finds its way into the churches whose floors are below the level of the churchyards. Professor Selmi, of Mantua, has lately discovered in the

¹ See foot-note, p. 53.

strata of air which has remained during a time of calm for a certain period over a cemetery, organisms which considerably vitiate the air and which are dangerous to life. This was proved after several examinations. When the matter in question was injected under the skin of a pigeon, a typhus-like ailment was induced, and death ensued on the third day.¹

The dangers of inhaling the atmosphere of churches or chapels under which burial-vaults are made use of or interments made, have been repeatedly pointed out.² In other lands besides our own have these dangers been suspected and detected. The Tuscan Government requested Signor Piattoli to thoroughly investigate the subject, and his report has been confirmed by eminent men of various nations. As having taken place in our own land, Dr. Copeland mentions the case of a gentleman who was poisoned by a rush of foul air from the grated openings on the sides of the church steps, and who died from a malignant fever in a few days' time, communicating the same to his wife with a fatal result. The same fever has been known to seize pew-openers when cleansing and shaking the mattings of the floor. After a vault had been opened, the

¹ Dr. De Pietra Santa.

² 'In vaults the air contains much carbonic acid, carbonate or sulphide of ammonium, nitrogen, hydrosulphuric acid, and organic matter. Fungi and germs of infusoria abound.'—Dr. Parkes, 'Practical Hygiene,' 4th ed.

smell was at times overpowering. It was the opinion of Mr. Chadwick, after examining some hundreds of witnesses of all kinds, that entombment in vaults was a more dangerous practice than interment in the earth, because of the liability of the coffins to burst.

We may, therefore, for our purpose, assume that, even under the most favourable circumstances, hurtful emanations must perforce rise out of burial-grounds, there being no more natural escape for the gases of decomposition than by levitation. These gases will rise to the surface through eight or ten feet of gravel, just as coal-gas will do, and there is practically no limit to their power of escape. The danger is always persistent in the cases of dry and porous soils, exactly those which are most fitted for cemetery purposes. In a churchyard at Stuttgart, in which only five hundred bodies were interred yearly, and not more than one in each grave, the north-west wind rendered the emanations from the dead perceptible in houses two hundred and fifty paces distant. It will thus be seen that the soil best fitted to ensure decay is exactly the worst one for neighbouring houses. Unless there can be some artificial means taken to bring about the slow combustion of these gases, as, for instance, by layers of charcoal, the gases must continue to escape in a foul condition. But who would recommend so extraordinary a procedure as this?

The dangers resulting from improper burial have of late been intentionally slighted, but there is abundance of evidence to prove that the air in the neighbourhood of choked-up graveyards is inimical to public health. Some sensitive people are even taken ill when walking past a cemetery.¹ I know myself a gentleman who can detect an unwholesome smell half a mile distant from a certain cemetery in the N.W. district of London. It is unfortunate that so little weight is attached to the report of the last Commissions upon Interments. The question of the poisoning of the air in the vicinity of burial-grounds is just now, however, undergoing a searching investigation at the hands of the Massachusetts State Board of Health, and an analysis will be prepared² of the answers elicited. Water believed to be contaminated with cemetery washings is sought for analysis. Questions are also asked as to the induction or aggravation of disease in houses contiguous to cemeteries, and whether the sickness was attributable to poisoned wells or foul air, or both. The report will, without doubt, confirm all that our leading physicians say as to the evils of injudicious burial. There must be something radically wrong where fresh meat becomes tainted in a single night.³

What shall we say of the poisoning of our wells

¹ Raulin.

² By Dr. Adams, of Pittsfield.

³ Frazer.

and water-supplies by too adjacent burial-grounds? Professor Brande has instanced a case of a well near a churchyard, the water of which had derived not only odour, but colour, from the soil, and gave it as his opinion that the water in all superficial springs near burial-grounds is simply filtered through accumulated decomposition. Some wells near a churchyard in Leicester were disused some time ago because of a perceptible taint in the water, and, in Versailles, several wells which were situated below the churchyard of St. Louis stank so much as to require shutting up. During the Peninsular War, our troops suffered greatly from low fevers and dysentery, caused by being obliged to drink the water from wells which were sunk too closely to the interred sick. Troops have often been compelled to change their encampments owing to this kind of water-poisoning. Cases are on record where men have been seriously injured by excavating amidst some water which had drained from graves. In Paris M. Ducamp, not long ago, discovered a spring which was entirely derived from the rain which fell in the cemeteries and from the liquids of decomposition; and the foolish people, discovering that it possessed the peculiar sulphur-like taste which is always concomitant with decaying organic matter, purchased it as a mineral water!

Dr. Mapother has visited the churchyards of many

Irish towns, and has 'generally found them placed on the highest spot near the most central part, whence of course all percolations descend into the wells.' One churchyard he particularly describes 'as lying so low that the water from the river overflows it in wet weather, and, notwithstanding this circumstance, from 30,000 to 40,000 people are supplied from this river.'¹

Instances of water-poisoning have been several times noticed of late years. The monumental cemetery of Milan, for example, is situated upon a hill some 180 yards to the north of the city, and Professors Parvesi and Rotondi have discovered in the wells of the Place Garibaldi, the water of which is collected from the valleys below the cemetery, undoubted traces of organic matter. Professor Reinhard also relates that during the murrain some cattle which fell victims were buried near Dresden at a depth of twelve feet, but that during the following year the water of a well some 100 feet distant from the pit gave off a foetid odour, and showed the unmistakable presence of deleterious matter. At even twenty feet distance the analysis discovered considerable impregnation. During

¹ The cemeteries at Finchley, according to Mr. Lowe, are drained into an open brook, and the drainage eventually runs into the River Brent. The cemetery at Tooting at the present moment discharges into an open ditch, and this flows into the River Wandle, from which many of the inhabitants in its vicinity are accustomed to draw supplies.

the Prussian occupation of Chalons, the city was visited by an outbreak of typhus, and to arrest the progress of the epidemic the dead were massed together in a corner of the city cemetery and interred, being first covered over with a quantity of quick-lime. At the end of some weeks, and after an episode of wet weather, the drinking water in the neighbourhood was affected by the influx of matter from the interred bodies and the lime, as was proved by an analysis made by M. Robinet.¹

The latest authenticated case of water-poisoning from infiltration of this kind is given by Dr. De Pietra Santa. He confines himself to quoting the example of the hamlets of Rotondella and Bollita, the cemeteries of which, placed upon the summit of a wooded hill, and at a considerable distance from the houses, have still been the means of carrying contagion into their midst. At the foot of the hill upon which the cemetery was perched emerged the springs destined for the daily use of the inhabitants, and these being the products of pluvial waters which had once spread over the surface of the two cemeteries, the water had filtered through the earth and become impregnated with the elements of the dead bodies. This contaminated water eventually produced a fearful epidemic. Dr. Pappenheim says that, if

¹ Dr. De Pietra Santa.

organic chemistry had made more progress, if, above all, the organic matters contained in drinkable waters were known, springs would be easily found containing putrefied substances, to the great injury of those who use the water, and it would be easily discovered that the evils came from a distant cemetery. People, however, are now more and more alive to the danger of subterranean infiltration from dead matter, and the use of wells in towns and cities is now nearly unknown. In Paris a law forbids the sinking of a well within one hundred yards of any cemetery, but in some cases two hundred yards has proved an insufficient distance. In parts of Germany, again, the minimum distance allowed by law is one hundred yards.

A great many cases could be raked up against the present mode of burial ; but I will not act the part of a special pleader. One might, however, point out that instances have occurred in which burial-grounds have been washed away by the bursting of reservoirs. In 1854, at Herrenlauersitz, upwards of one hundred bodies, the majority still encoffined, were washed out of their resting-places by an inundation, and floated into gardens, harvest-fields, and houses, nor were they wholly recovered until a fortnight after the calamity.

It would be manifestly unfair to charge against

proper interment the loose manner in which it is practised in many parts of the globe. But the evil is so persistent a one that I cannot refrain. It might be forgiven to the poor heathens of Eastern Australia to bury their dead in shallow graves, for there predatory animals are scarce, and want of civilisation could be pleaded for them. But how can we overlook the practices in the Mahomedan cemeteries of Calcutta? I am informed by a gentleman¹ who was for thirty years Church missionary there, that these burial-grounds of Islam 'have long been a crying evil, and the nurses of cholera, fever, and dysentery.' The bodies are also frequently devoured by jackals. So, for the matter of that, are the bodies of the Ainos.² But then the Ainos are heathens and the Mahomedans are—well, people who ought to know better. They are incorrigible, however, as I have myself seen. Even in Syria at the present hour many modern Moslem graves, although lined and roofed with slabs of basalt, are open and their inmates exposed.³ But a travelled Osmanli would perhaps retort and point out that Père-la-Chaise was visited by a monomaniac who was able nightly to tear up a number of bodies.⁴

I will conclude with one more example of the laxity with which interments are conducted. In the

¹ The Rev. S. Long.

² Burton.

³ Lieut. Holland.

⁴ In 1849.

streets of Valparaiso, in Chili, a large and flourishing city of 75,000 inhabitants, many of whom are British and French, may be seen the Cerro de la Concepcion, a hill long since constructed into a cemetery, which is so saturated with decomposition that it has lately rent asunder and exposed the city to the foulest of all exhalations. And what is the consequence? Why, the coffins and the contents have now frequently to be submitted to the flames, in the full view of the population.

CHAPTER V.

PRESENT STATE OF THE CREMATION QUESTION.¹

It will perhaps prove interesting to consider the present position of the question in some of the chief countries of the civilised world.

Italy has been the pioneer of cremation, as far as arguments and experiments go, although not the first to reduce it to everyday practice. Here, many centuries ago, it was seen in all its olden glory. Italy too was, I believe, the first to put a veto upon the introduction of the diseased dead into the country without previously reducing them to ashes, as in the case of a person who died of yellow fever in America.²

The project of cremation was laid before the International Medical Congress of Florence in 1869 by Professors Coletti and Castiglioni, and was favourably received by the whole assembly. The same opinion was arrived

¹ For further details under this head, see 'La Crémation des Morts,' par Dr. Pietra Santa.

² Dr. Borgiotti, quoted by Dr. Golfarelli.

at by those who took part in the Congress of Rome in 1871. The Royal Institute of Lombardy (Science and Letters), in order to encourage the study of the question, offered the 1877 quinquennial Secco-Comneno prize for an essay upon the subject which would best meet objections and which would best illustrate from actual experiments upon the lower animals that the method was convenient, speedy, economical, and decent. In a second manifesto laid before the two Houses of Parliament, the Institute reiterated its conviction that the adoption of incineration would prove a new era in the march of civilisation, and expressed hopes that Italy would lead the van in the great movement. The elevated position held by these early advocates of the system gave a huge impetus to the movement.

Very important papers have been laid not only before the Royal Institute of Lombardy, but also before the Academy of Padua, and the Society (Medico-physique) of Florence. In order to popularise the practice of cremation, conferences have also been held at Florence, Milan, Naples, Genoa, and Venice. The columns of the public press have also been taken due advantage of, and many interesting articles have appeared upon the matter. Later on, Professor Maggiorani made a representation in favour of the scheme to the Senate. The Chamber of Deputies was also appealed to to sanction the practice, and Drs. Bono and

Amati convoked a congress at the central city of Milan in April 1874, when upwards of 500 people interested in the matter met, and listened to discourses upon the subject spoken or communicated to them by Drs. Polli, Pini, Coletti, Musati, Amati, Tarchini-Bonfanti, Sacchi, and Du Jardin. The conclusion unanimously arrived at was to appeal to the Italian Parliament to insert in the new sanitary code an article permitting cremation under the supervision of the syndics of the commune. During the sitting Professor Sacchi observed that if the Italians resorted to cremation they would only be following the customs of their forefathers, as might be observed on all sides of them—a remark which has proved true to the very letter, for at the present moment, near the Campo Santo at Bologna, an exhibition has been opened where may be seen not only very elegant vases containing ashes, and dug up in that cemetery, but also skeletons from the same place.¹ In no part of Italy perhaps can the relative worth of cremation and burial be better seen than in Bologna. Both practices were contemporaneous there about 700 B.C.

The works written in Italy upon cremation are of considerable importance. In 1857 Professor Coletti contributed a paper to the Academy of Science and Letters of Padua,² in which he strongly recommended

¹ 'Echo,' Sept. 23, 1874.

² 'Sulla Cremazione dei Cadaveri.'

cremation. This was followed by an article in 1866 by Dr. V. Giro, also approving the practice.¹ In 1867, and again in 1870, Dr. Du Jardin called attention to the many advantages offered by cremation,² which first communication was followed by a paper by Dr. P. Castiglioni, similarly advising its adoption.³ Dr. Golfarelli, previously alluded to, also read a paper before the conference held at Florence in 1871, of course all in its favour.⁴

Dr. Polli, whose labours on this subject are so well known, published in 1872 a very interesting memoir upon cremation.⁵ Dr. G. Pini gave to the world his sentiments in its favour in 1871,⁶ and again in 1873,⁷ explaining the various and most likely methods of procedure. An historical review of the subject was also issued from the pen of Dr. F. Valerani in 1872.⁸ Dr. G. B. Ayr eloquently advocated the burning of the dead in 1872-3,⁹ and again in the latter year the system was upheld by Dr. Fornari.¹⁰

In 1873 Dr. C. Musatti published a very interesting historical dissertation upon the subject,¹¹ and gave his opinion that at the beginning of the process means

¹ 'Sulla Incinerazione dei Cadaveri.'

² 'Sulla Cremazione dei Cadaveri.' ³ *Ibid.* ⁴ *Ibid.*

⁵ 'Sulla Incinerazione dei Cadaveri.'

⁶ 'La Cremazione dei Cadaveri.' ⁷ *Ibid.*

⁸ 'Sulla Incinerazione dei Cadaveri.' ⁹ 'La Cremazione e l'Igiene.'

¹⁰ 'Humatio vel Crematio.'

¹¹ 'Intorno alla Cremazione dei Cadaveri.'

might easily be taken to ascertain whether the subject was in a trance. In 1873 Dr. F. Anelli published an article¹ in which he dealt with some objections urged by Dr. Rota, in 1872,² against the burning of the body, stating it as his own opinion that whilst burial recalled the middle ages and even the times of barbarism, cremation represented progress and civilisation. Much the same view was taken by Dr. O. Giacchi in a memoir read in Florence in 1873.³ Dr. L. Brunetti also explained the methods of incineration in a brochure published in 1873,⁴ and in the same year Professor Amati published a letter,⁵ in which amongst other things the economy of cremation was argued. Several articles followed from the pens of Drs. Peyrani and Foldi. The most complete work, however, issued from the Italian press was that of Dr. F. dell' Aqua, published in 1874.⁶ A very valuable historical report of the question has also been recently issued by M. Biondelli.⁷

The above represent for the most part the chief writers upon the subject of cremation in Italy. And, as will be noticed, all, with one notable exception, were learned professors and doctors. The

¹ 'La Cremazione dei Cadaveri.'

² 'L'Incinerazione dei Cadaveri è ammissibile?'

³ 'La Cremazione dei Cadaveri.'

⁴ *Ibid.*

⁵ 'Sulla Cremazione dei Cadaveri.'

⁶ 'La Cremazione dei Cadaveri.'

⁷ 'La Cremazione dei Cadaveri umani.'

only productions inimical to the scheme were the dissertation of Dr. Rota, which was sentimental to a degree,¹ the brochure of Professor F. Zinno, which might come under the same category,² and some utterances upon the subject from clerical points of view.³ The muses were also invoked on both sides, and poems upon the subject have been published by Dr. A. Moretti and Professor Polizzi.⁴

In Switzerland cremation has found an admirable and indefatigable champion in Dr. Wegman-Ercolani, whose articles and works⁵ upon the subject have excited the greatest attention. Owing to his exertions two associations have been founded, at Aran and at Zurich, and others are in process of organisation, for the purpose of instilling into the minds of the public the superior advantages which this method of disposal of the dead offers over the ordinary mode of burial. A public meeting held at Zurich in 1874 was attended by 2,000 persons, and a speech was made then by Dr. Ercolani, in the course of which the sentimental objections raised by Professors Blermer and Clœtia were energetically combated. On the same occasion Dr.

¹ 'L'Incinerazione dei Cadaveri è ammissibile?'

² 'Inumazione, Imbalzamazione e Cremazione dei Cadaveri.'

³ In the 'Osservatore Cattolico.'

⁴ In the 'Annali di Chimica,' &c.

⁵ In the 'Gazette d'Andelfingen.' See also 'Leichenverbrennung als rationellste Bestattungsart.'

Goll also defended incineration as a sanitary scheme. The Rev. Pastor Long followed, with some interesting remarks upon the religious side of the question, one of them akin to the now celebrated saying of his Grace the Bishop of Manchester, to the effect that with the Creator resurrection was as easy from the ashes as from the dust of a skeleton.¹ Mr. Long declared the urn to be a symbol far more poetical than the tomb or the mausoleum.

Professor Weith, who made a journey to Italy to consult with the professors there as to the practicability of several methods of burning, also pronounced in favour of cremation. Professor Kinkel gave in a public adhesion to the system, and remarked that to him burial in the earth seemed a flagrant violation of the idea of eternal repose. He would rather destroy the body at once than bury it in cemeteries, and, after a lapse of time, dig up the skeleton and submit it to the flames. The meetings in Zurich have been carefully watched by the neighbouring nations and warmly approved of, particularly at Milan.² Cremation will soon be duly established in Switzerland.

The question of cremation has been considerably agitated in France. A memoir written by Legrand

¹ The same remark was made by Napoleon at St. Helena, when expressing his wish that his body might be burnt.

² Le 'Pungolo' de Milan.

d'Aussy,¹ in the year V. of the Republic, put very succinctly the necessity of substituting cremation for inhumation, and the project was shortly after laid before the Tribune, Article 5 of which manifesto left it optional for each family to choose between the two modes of sepulture.²

The Institute of France later on offered a prize of 1,500 francs for a report upon the scientific side of the question, and of forty dissertations sent in, the only fear expressed was concerning the possibly excessive price of the fuel necessary to a complete combustion.

Dr. Caffè, to whom I am indebted for several interesting communications, published in 1856, and again in 1867, *résumés* upon the whole subject which are eminently worthy of conservation. He leans to the idea of the formation of *columbaria*, similar to the sepulchral chambers of the Romans, and in his letter to me he says, 'that the presence of ancestral urns is calculated to restrain many a one who is tempted to tread the path of crime and ruin.' M.

¹ 'Sépultures Nationales.'

² It is worthy of notice, that upwards of thirty years ago Honoré de Balzac, in his novel *Madame Jules*, represents the husband of the dead lady as applying to the Minister of the Interior for leave to burn her body, and upon obtaining it, he put the ashes in an urn, and placed the latter in his cabinet. He was evidently in favour of the scheme, and chose to record his approval of it in this way.

Bonneau,¹ Drs. Lapeyrère,² Dechambre,³ and Latour,⁴ have also inserted several valuable articles in their various journals. Dr. Latour emphatically remarks also that if the human race had for the last 3,000 years practised, for instance, embalming, there would not have been to-day a portion of the earth's surface which was not occupied by a mummy. Dr. Lapeyrère upholds cremation, citing as a chief reason the dangers which may result to public health when there are many thousands of dead soldiers.

Inspector Laveran having called the attention of the Council of Public Health to the necessity of resorting to cremation, Intendant-General Robert proceeded to ask the advice of the Medical Chief of the Army Staff, but I understand that the result arrived at was of a very undecided character. The Medical Chief of the army also called together the two Councils of Public Health of Paris and Versailles, in order to take proper steps under the circumstances which immediately followed the late investment of Paris. Baron Larrey issued a report upon the general subject, and laid down the conditions upon which a cemetery should be chosen under such pressing circumstances. He recommended interment in deep pits, and the use of quick-lime, as being a slow kind

¹ 'La Presse.'

² 'France Médicale.'

³ 'Gazette Hebdomadaire.'

⁴ 'L'Union Médicale.'

of cremation and as not offensive to religious and other feelings.

The most recent document is the report presented to the Municipal Council of Paris in 1874 by M. Herold respecting the establishment of a new cemetery at Méry-sur-Oise. Many interesting passages are to be found in it, advocating the *permissive* practice. The chief French dissertations upon the question of cremation are, however, those of Dr. De Pietra Santa, who published them at first in 'l'Union Médicale.' They were afterwards published with some additions in 1873.¹ This last work,² which embraces all that previously appeared from his pen, must be regarded as a complete manual of the subject, and I am indebted to its pages for much of the information given in this chapter. He has carefully traced the modern history of cremation, and has accorded to Sir Henry Thompson great meed of praise. He deplores, however, the paucity of sympathy which the subject has met with in France. The scruples of some, the open objections of others, and the listlessness of all, have been only too apparent. The learned doctor may, however, rest assured that when calmer times fall upon France, his work will be studied with the care to which it is entitled, and the commission

¹ 'La Crémation des Morts en Italie.'

² 'La Crémation des Morts en France et à l'étranger.'

which he seeks will be appointed to consider the question. In less quiet times the question as to the site of a new cemetery would have been linked with a query as to the best kind of cinerator. France will not forget Dr. Santa, and a place will be reserved for him in the roll of her benefactors. At the present moment the Prefect of the Seine has addressed a circular to all the cremation societies in Europe, asking for information respecting burning of the dead, with an offer to exchange publications issued upon the subject.

In Belgium no practical results have as yet been arrived at; still cremation is affirmatively upheld by very many persons. In a small country like this, where the cemeteries alone occupy over 18,000 acres, the useless waste of land alone would in due time insure the adoption of burning.

The home-produced literature of cremation in Belgium is small in extent, but reprints of Italian and other authors are common. The admirable work of Dr. Polli, for instance, was translated and published in 1873.¹ Another translation appeared in the 'Presse Médicale Belge' during the same year. The 'Gazette de Bruxelles' of March 1873 also contained articles upon the subject.² During the year 1874, a

¹ By Dr. Janssens in the 'Journal de la Société Royale des Sciences Médicales et Naturelles de Bruxelles,' 1873.

² 'Brûlez les corps et ne les ensevelissez pas.'

séance was held at Brussels through the exertions of M. Adolphe Prins, an *avocat* of that city, and the manner in which the subject was received by the artistic and literary *élite* augurs well for the future of cremation in that country.¹

The exhibition of Professor Brunetti's examples of cremation at the International Exposition of Vienna gave perhaps the first strong impulse to a study of this subject in Austria, and the unsatisfactory state of the cemeteries in Vienna has convinced a great number of the desirability of resorting to cremation. In February 1874 the Municipal Council of Vienna unanimously passed a proposition to the effect that the superior administration be asked to provide for the immediate carrying out of the system of cremation, now that the question of a new cemetery had been mooted. One of the council, M. Geissler, was mainly instrumental in bringing forward the motion. At the same time the Imperial Academy of Medicine are making an appeal to the professors of hygiene and chemistry in the Empire for a complete report upon the subject. The cremation committee is formed of five persons, Drs. Hoser, Gauster, Novak, Haschek, and Steniger.²

The municipality of Vienna—the annual mortality

¹ 'L'Indépendance Belge,' avril 1874.

² 'Brûlons nos morts,' 1874.

of which place is about 20,000—acting upon the advice given by the Board of Health in that city, has now decided that cremation shall be carried out by those who prefer it, upon the plan inaugurated at Leipzig. The cemeteries of Vienna are not only well filled with dead, but they are unpleasantly near to the city. A plot of ground has therefore lately been acquired by the municipality, about five miles from the centre of the city. This new cemetery was opened in November 1874, and on the same day the five Catholic churchyards were closed against all further interments. With the poor, however, the removal of the body from the mortuary chamber to the mortuary building of the district, and then next morning to a distant cemetery, is a serious matter.

Nothing can apparently look more charming than a cemetery sparsely dotted with monuments, as, for instance, the Necropolis at Woking, seen from the railway station; but they speedily, far too speedily, fill. The cost of conveying bodies to these distant cemeteries must also be taken into account. In Vienna, where the city burial-grounds are 'more than full,' the question of conveyance to the new cemetery has provoked a great deal of angry discussion, and has been the means of bringing into notice several schemes for the transportation of the bodies to the site of burial. Mr. von Felbinger, engineer, and Mr. Hubetz, architect, there,

have submitted a scheme of pneumatic burial to the municipal council. They propose to erect in the city a central temple, from which a subterranean passage would lead to the cemetery. A line of rails would be laid down in this passage, and an iron car with its freight of coffins would be propelled through it by means of a blast of compressed air. The tubular passage would be five feet in diameter, and by the aid of a 150 H.P. engine they would undertake to convey the car some 15,000 feet in ten minutes. The funeral ceremony would be performed at the central chapel, and it would be optional with the mourners as to witnessing the actual interment at the cemetery terminus. The temple would be built with three distinct compartments, so to speak; one for the accommodation of the Roman Catholics, one for Protestants, and one for the use of the Jews.

The question of burning the dead has therefore come to the front, and a society called the 'Urne' has been constituted to realise the idea. Several meetings have been held, the persons present giving their most cordial support to the movement. Hitherto little or no opposition has been met with from clerical parties.¹ It has been stated, moreover, that a donation of 30,000 florins has been presented to the society by a wealthy lady, in order to help on the practice.

¹ 'Times,' May 1874.

Cremation has met with the greatest enthusiasm in various parts of Germany, as might have been expected from so practical a people. The authorities in the town of Dresden, in Saxony, offered to make it conditionally legal, provided that its advantages were thoroughly made manifest by the promoters, which must have been duly done inasmuch as the *Presse* of Dresden informs the world that the first corpse was reduced to ashes in the Whitsuntide of 1874.¹ When the ashes were withdrawn, the funeral ceremony was celebrated in the usual manner. Several other cremations have also taken place there.

The best German apparatus for cremation is that constructed by Professor Reclam and Mr. Friedrich Siemens, C.E., and was first tested upon the lower animals on June 2, 1874, in the presence of Drs. Fleck, Küchenmeister, Roth, and other medical celebrities.² Mr. Steinmann, of Dresden, also made some improvement upon the Siemens apparatus as at first produced.

In Berlin an apparatus is also in course of construction, and a pamphlet has lately been issued by the Association for Burning the Dead there, which is intended to combat any prejudices that may exist against the adoption of the practice. At a recent meeting of

¹ On the fourth day of Pentecost.

² 'Cologne Gazette,' June 11, 1874.

the council representing the Jewish congregations of Berlin, a motion was brought forward and adopted by a large majority, to take immediate steps for the introduction of cremation in one of the Jewish cemeteries.¹ The wholesome practice is also being warmly taken up in other large towns.

The chief works upon the subject which have been hitherto published in Germany have been those of Drs. Trusen,² Küchenmeister,³ and Reclam.⁴ The last work is a very complete defence of the system. Mr. Steinmann has also published a work upon the best kind of furnace.⁵

In America the same active propaganda is going on in favour of incineration of the dead, and the New York Incremation Society have applied to the Legislature of that State for an act of incorporation. Amongst the promoters are to be numbered some of the most distinguished men in America. The Society accepts the obligation of burning the bodies of its members, unless objections are raised by the relatives of the deceased. A German Society has also been formed in New York. Both Societies have progressed consider-

¹ 'Jewish Chronicle,' April 10, 1874.

² 'Die Leichenverbrennung,' 1855, and 'Denkschrift von Leichenverbrennung,' 1860.

³ 'Ueber Leichenverbrennung,' 1874.

⁴ 'De la Crémation des Cadavres,' 1874.

⁵ 'Sur le Procédé régénérateur et la manière de le pratiquer.'

ably in point of numbers, and the system of reduction to be chosen has even been decided upon. The chief work on the subject hitherto published in America is that of Professor Frazer,¹ and must have considerably enlightened the nation as to the true merits of cremation. It is not very long since a Persian gentleman in an Eastern State, who wished to burn the remains of his dead wife, was personally assaulted by an ignorant mob and compelled to resort to ordinary burial.² But several cases of cremation of human bodies have been performed in America.³

In England several attempts have been made from time to time to popularise the idea of burning the dead. Perhaps the earliest literary production in its favour was that of Sir Thomas Browne.⁴ Amongst later productions is one by Dr. J. Jamieson, written entirely from an historical point of view.⁵ Another work was issued in 1857 by a 'Member of the Royal College of Surgeons,'⁶ and papers have also

¹ In the 'Penn Monthly,' June 1874, and since reprinted separately.

² 'Chicago Daily Inter-Ocean,' March 1874.

³ Henry Laurens, first President of the American Congress, and later on, George Opdyks.

⁴ 'Hydriotaphy, or Urn Burial,' 1658, and other editions.

⁵ 'Origin of Cremation.' Proceedings of the Royal Society of Edinburgh, vol. viii.

⁶ 'Burning the Dead, or Urn Sepulture,' by Mr. Chas. Cobbe. A few copies are still obtainable from Knowles, Celbridge Place, Bayswater, London.

occasionally been written in various periodicals. Several articles favourably treating it from the religious side of the question have also appeared.

The benefits of cremation have been persistently brought before the authorities of London, and by none more energetically than Dr. Lord,¹ but as a matter of course nothing could be done, as a suitable means of cineration was not at hand.

The only practical work which has ever appeared in England is that of Sir Henry Thompson,² the first part of which appeared in the 'Contemporary Review' of January 1874, and the second part in the March number. It treats of the question entirely from the practical side, and it will be impossible to understand the full merits of cremation without perusing it. Its appearance has marked a new era in the history of the question, and the whole of the foreign press are unanimous in its praise. Indeed nearly every European nation has now translated it for itself. It has awakened in our land an interest which cannot possibly subside, and its arguments have found a willing confirmation in the minds of thousands of all classes. There can be no doubt also that the kind of apparatus chosen by Sir Henry Thompson, after several crucial

¹ Medical Officer of Health for Hampstead. Reports for the years 1857-1858, 1864, 1867, 1873, and 1874.

² 'Cremation.' H. S. King & Co., London. 2nd ed. 1s.

tests, will prove the most suitable one which can be devised.¹

The Cremation Society of London, which is intended as a parent society with which others in any part of the land can be affiliated, was founded on January 13, 1874, by some of our most representative men, and shortly after a declaration² was issued to the public

¹ Since the publication of Sir Henry Thompson's work, and the reports of the active propaganda which is being carried on abroad, a great number of articles, favourable or well inclined to the practice, have appeared in the public press: for instance, in the 'Daily News,' 'Telegraph,' 'Standard,' 'Morning Advertiser,' 'Globe,' 'Saturday Review,' 'Court Journal,' and numerous illustrated and other papers. The 'British Medical Journal,' 'Lancet,' 'Medical Press and Circular,' 'Medical Record,' 'Sanitary Record,' 'Students' Journal and Hospital Gazette,' &c., have also borne witness to its value as a sanitary measure. Both Church and Nonconformist journals have moreover written in its favour, and several able articles have appeared in the periodicals, for example, in the 'Dublin University Magazine' and 'Westminster Review.' Most valuable assistance, demanding special notice, has also been rendered to cremation by that highly scientific periodical, 'Iron.' The process has also been made the subject of discussion in various debating societies, and in May 1874 the Cambridge University Union adopted a motion by 101 votes to 42 in favour of introducing it into England.

² '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.'

The conditions of membership are:—

- I.—Adhesion by signature to the above declaration.
- II.—The payment of an annual subscription of one guinea, or a single payment of ten guineas.

In order to carry out the above objects it has been resolved to raise funds for the purpose of carrying into operation the practice of cremation

which had the effect of proving to the founders of the Society how very prevalent and how widely spread was the antipathy to the present mode of burial. The aim of the Society is to promote the substitution of cremation for burial, by diffusing information on the subject, by co-operating with foreign Societies, and by raising funds to obtain an apparatus of the most approved kind, together with a suitable site, so that, for those who desire the performance of cremation after death, ample means should be available for the purpose. The letters of adhesion to the scheme which have been already received have come from every class of society, from Peers to the humblest commoners.

Chief in its favour, in point of numbers, after the general public, come physicians and surgeons, and after these ministers of religion of all shades, Fellows of Colleges, officers of the Army and Navy, &c., in about equal degree. The number of ladies who have joined the movement is considerable, and some of them have proved the most active members. The Preliminary Council of the Society includes names of the highest standing in the country in Science, Literature, and Art, and the list is continually being extended. There is every prospect now of being able to accomplish the object sought by the promoters. Some preliminary negotiations were

through the agency of cemetery companies, parochial and municipal authorities, or other public bodies.

entered into with a large cemetery company, but came to no practical result, the board of management 'not being able to lift their eyes to the dignity of the subject.' Steps are being taken at the present moment to enlist more contributing members in the Society, and to enable it, with augmented funds, to purchase a site for itself whereon to erect a suitable apparatus. Several donations, one of considerable amount from a well known philanthropic lady, have been received by the treasurer.

CHAPTER VI.

CREMATION, ANCIENT AND MODERN.

IT is not my intention to describe the funeral rites of the ancient Greeks and Romans &c.,¹ because the practices of some Eastern nations at the present day somewhat resemble them, and it will consequently be sufficient to refer to some of these. Moreover, descriptions of cremation in classic times may be met with in every encyclopædia. Full details of these ancient forms of sepulture will also be found in numerous antiquarian works.²

¹ In the play of 'Virginius' the body of Virginia is represented as having been placed in an urn, and when the distraught father enquires for his missing daughter, the vase is placed in his hands by the sorrowing lover. When this scene is presented, the thrill which seizes the audience is succeeded by a sensation of admiration at the eminently superior system of the ancients. I have seen the actor Brooke in this tragedy, and the effect which he here produced was inexpressible. Many whom I have consulted as to the feelings engendered at this point, have invariably declared that they were at the time complete converts to cremation, and that the sense of approval only left them when they began to realise how impossible were funeral pyres in this country. Happily the Siemens apparatus is now at hand, and its suitability proved beyond all cavil.

² Laurentius, 'De funeribus antiquorum;' Kirchmannus, 'De funere Romanorum;' Montfaucon, 'Les funérailles des Grecs, des Romains,'

For a similar reason I will not describe the burning of the bodies of Williams and Shelley.¹ The ceremony was moreover somewhat harrowing owing to the impossibility of obtaining proper materials for the purpose. It will be more interesting to the reader to furnish him with a description of a still later instance of cremation; I allude to the burning of the body of the Rajah of Kellapore at Florence in 1873, and I quote here the description of the affair as given by Dr. Pini in the *Gazetta di Milano*.

At the hour of midnight the mortal remains of the Indian prince were carried to the banks of the river. The funereal pile consisted of a heap of wood, about five feet square, firmly fixed and secured to the ground by seven bars of iron. A second heap of wood was thrown loosely around. After certain religious ceremonies, the pile was powdered with camphor and other aromatic substances, and the dead rajah was laid upon it. The body was anointed with pure naphtha, the features covered by a mask of some greasy substance, and all the limbs covered with resinous matter, betel-leaves, perfumes, and powdered sandal-wood. The corpse was then covered with more layers of wood, alternated with inflammable substances, and the next of kin to the prince set fire to the pile. Although the flame was fanned by a strong wind, the body was barely consumed at seven o'clock the next morning. At ten, when the fire had

&c.; Muret, 'Cérémonies funèbres de toutes les nations;' Porcacchi, 'Funerali antichi;' and many others to be found in public libraries.

¹ See Trelawney's 'Last Days of Shelley and Byron.'

almost entirely burned out, nothing remained but a heap of ashes. An Indian priest collected a small quantity from the centre of the heap; the remainder was thrown to the wind, in the direction of the current of the Arno.¹

Let us now see how cremation is performed at the present day among the poor in India.² The Madras correspondent of the 'Medical Times and Gazette' thus describes the mode practised in Madras:—

The actual process of burning here is simple and effective, and well suited for people amongst whom fuel is one of the dearest of the necessaries of life, besides being subject to a tax, which has been greatly mitigated by the present governor. A bed is prepared; it is said in the old

¹ It has been seriously debated by some eminent men whether or not the ashes should be utilised, instead of being thrown away or gathered for preservation in urns.

² The cost of a Hindoo funeral of the humbler class in the neighbourhood of Poona, according to Ccl. Martin, is as follows:—

	R.	A.	P.
Bamboo sticks for making the trestle . . .	0	14	0
Dungaree cloth for winding sheet . . .	1	8	0
Twine for binding the trestle . . .	0	2	0
One bundle of kurbie for placing on trestle . . .	0	1	6
Golal powder for sprinkling over the body . . .	0	2	0
Flowers and betel-leaves for placing upon it . . .	0	2	0
Saffron for the sprinkling water . . .	0	2	0
Vessel for carrying fire . . .	0	2	0
Piece of gold or pearl for placing in the mouth. . .	0	8	0
Three copper pice to tie in the clothes . . .	0	0	9
Rice, &c., for dropping on the road, &c. . .	0	4	0
Sandal-wood for burning . . .	0	1	0
Firewood for making fire . . .	7	0	0
Oil or ghee for increasing the flame . . .	1	0	0
Refreshments for friends . . .	0	8	0
Total . . .	12	7	3

books that it should be as long as a man with his arm extended above his head, a fathom wide, and a space deep; it is also said that it ought to be on rising ground, so that the water poured on the ashes may easily run off. On this bed is laid a layer of wood and 'bratties'—that is, cakes of dried cow-dung, which in this country is the most frequent form of fuel. The body, which is brought on an open bier, is laid on this, and covered with fresh layers of wood and bratties. Fire is set to the heap, which is then covered with a thinnish layer of earth. The process, which lasts altogether twelve hours or more, is divisible into two portions:—First, the fire is allowed to char and smoulder, out of the free access of air, till all the heap becomes a glowing red-hot mass, just as in charcoal-burning or ballast-burning at home. But after the fire has penetrated the whole heap it is poked up, the air admitted, and there is a thorough blazing fire, which goes on burning till all the fuel is turned into ashes, amongst which are discernible some of the hardest bones—as the malar, temporal, and shafts of the long bones—semi-vitrefied.

The above describes a funeral of the poorer kind, but in a late number of the 'Bombay Times' appears an interesting account of the burning of the body of Mr. Veneyekras Juggonath Sunkersett, an eminent citizen of that city.

The funeral procession from the house of the deceased was sufficiently large to demand a special report. Not less than a thousand persons figured therein, 'every family in the caste having furnished one or two of its male members to swell the melancholy cortège.' Bareheaded, and dressed

in white garments, the procession marched slowly on. First came an array of link-bearers; then, also surrounded by lighted torches, and borne aloft on the shoulders of six men, the corpse was carried, preceded by Brahmin priests chanting a monotonous dirge. Arrived at the burning-ground—a spot to which admittance is made difficult—the body, lying on a bier, was deposited on the ground, the torch-bearers forming a circle around. The bier consisted simply of split bamboo sides and arms, with a rush bottom, and was subsequently broken to pieces and burnt. The object of depositing the bier on the ground was to allow all present to take a last look at the features of their friend and leader. Many simply salaamed, others knelt and appeared to pray, while others indulged in tumultuous ululation.

During the time occupied in these last farewells, the men attached to the burning-ground had been busily employed in erecting the funeral-pyre; and the corpse was at length lifted off the bier, and placed on the pile. Officiating Brahmins then anointed the body with a mixture of which the principal constituent was ghee. Hard by was piled a heap of fragrant sandal-wood, split into thin faggots, and these the relatives of the deceased laid one by one upon the body, the priests all the while reciting prayers for the dead.¹ This ended, the servitors of the dead-ground

¹ The following compilation from a burial service of the Brahmins, who are the priests of all the other castes of Hindoos that burn their dead, may prove interesting to the reader. It is extracted from the 'Sacred Anthology.'

'*O Earth!* to thee we commend our brother: of thee he was formed, by thee he was sustained, and unto thee he now returns.

'*O Fire!* thou hadst a claim on our brother during life: he subsisted by thy influence in nature: to thee we commit his body, thou emblem of purity; may his spirit be purified on entering a new state of existence.

built up the pyre to its proper height with common fire-wood. All being ready for the final ceremony, the Brahmins lit a small fire of sandal-wood, and, having consecrated it, gave a flaming brand to each of the kinsmen present, whose duty it was to light the pyre. Then the flames shot up into the air, a canopy of smoke overhung the spot, and all was over. The mourners dispersed, and by midnight nothing remained of our well-known citizen but a handful of white ashes and a few calcined bones.

During the past year the remains of the Hon. Narayan Wassadeo, a member of the Legislative Council of Bombay, were solemnly burnt on the burning-ground at Sonapore, and the ceremony is thus described in the 'Times of India,' Aug. 6, 1874 :—

The body was placed, after it was recovered from under the ruins, on the floor of a large apartment at the rear of one of the wings of the house; and the female members of the family, seating themselves around it, gave themselves up to uncontrollable grief. The unhappy widow was overwhelmed by the dreadful calamity which had befallen her. A great number of the leading members of the European and various native communities called and took a last look at the remains as they lay covered with a white robe, the lower part of the face being alone exposed.

' *O Air!* while the breath of life continued, our brother respired by thee: his last breath is now departed, to thee we yield him.

' *O Water!* thou didst contribute to the life of our brother: thou wert one of his sustaining elements: his remains are now dispersed, receive thy share of him who has now taken an everlasting flight.'

The procession started at about 7 P.M. The bier, composed of two long pieces of bamboo, with a couple of cross-pieces, and covered with a rich white shawl, was upheld by the deceased's eldest brother and three of his most intimate friends and relatives. The sacred fire, which had been kindled with due ceremonies at the house, was carried in front in a brazen vessel by the deceased's son. The funeral was largely attended, not only by members of his own caste, but by those of other castes and denominations. When the procession reached Sonapore the bier was placed on the ground while the pyre was being constructed. Men with short crow-bars made six holes in the earth, and in each of these was placed a rough piece of timber about four or five feet high. The posts, ranged two and two, were about a yard distant from each other. Three logs about six feet long each were placed on pieces of wood between each pair of uprights, so as to allow a free draught under the whole. A number of smaller logs were placed on these large ones, and were covered with sandal-wood, which made a sort of bed for the reception of the body. While this was being done, a number of torches of sandal-wood were being carefully ignited by the deceased's son at the sacred fire, which he had brought with him for the purpose. Prayers were said while the ignition was in progress. All being ready, the bier was brought to the side of the pyre, and the body was divested of all covering, except a cloth around the loins. It was then lifted on to the pyre, which was by this time between three and four feet high. The upright posts confined the body on either side, and prevented the possibility of its rolling off. Small blocks of sandal-wood, of various lengths—from six inches to two feet—were placed

lightly on the body. The deceased's son then took a brazen vessel full of water, and carefully sprinkled a circle on the earth around the funeral pile. He next seized a brand from the sacred fire, and applied it to some dried leaves, or similar combustibles, placed under the pyre. That did not set fire to the pyre, however, and was not intended to be more than a compliance with the ceremonial; the brand was red, but not blazing, and a spark or two only fell from it. The relatives were then, as is usual in such cases, led away from the pyre by the friends around, so as to spare their feelings as much as possible. When they were taken a few yards off, and their backs turned to the pyre, large logs, similar to those at the base, were placed over the body, which now became completely concealed—all but the feet, which were left exposed either by accident or design. The friends applied matches to the sandal-wood brands, and, when they blazed up, set fire to the combustibles. Owing doubtless to the dampness of the ground, and occasional drops of rain, it was a matter of some difficulty to get the mass to burn. Cocoanut oil was thrown on the wood, and screens were held by men so as to regulate the draught; and, after a long interval, the pyre blazed up fiercely. In three hours only a handful of ashes remained of him who was but that morning the influential leader of the Hindoo community, full of life and hope.

The above two cremations may be regarded as sumptuous ones, and far above the means of the common people. With the latter an incomplete burning was often performed with revolting results. Descriptions of these failures have frequently been given

by travellers of more or less veracity. The matter was lately taken into consideration by the English authorities, and this has led to the suppression of such imperfect cremations.

By the order of Sir Cecil Beadon a cinerator was erected at Calcutta for the burning of human bodies; and various regulations were issued with the view of abolishing the ancient system of imperfect cremation. The funeral pyre was not absolutely prohibited within the limits of the city; but the disgusting custom of throwing partially-consumed bodies into the river was at once put down. Sir Cecil Beadon also forcibly suggested that all bodies should be taken outside of the city, to be burned in some suitable place set apart and enclosed for the purpose. Against this excellent proposition a fearful outcry was raised, and the municipality was induced to confine the suggested improvement to building the cinerator on the site of the old burning-ghât, on the banks of the Hooghly. At first the Hindoos objected to use the cinerator; but, on finding that it involved no interference with their religious rites or feelings, they partially acquiesced in its use. The cinerator built at Calcutta was not quite a success; but the bodies were consumed to ashes, and the fumes carried away through a tall chimney or stack.¹

I am informed by the Sanitary Commissioner of Madras, that the Cinerator² erected by the authorities is scarcely ever used, but he is of opinion that if the Siemens principle of a furnace were exhibited before

¹ 'Iron.'

² See foot-note, p. 39.

the educated Hindoos they would very probably adopt it.

Here is another extract explanatory of the reform just alluded to.

From the Health Officer's Report to the Bombay Municipality we find that the cost of fuel for cremation is exceedingly heavy; and that a body cannot be consumed under four hours. 'On more than one occasion bodies have not been totally consumed, the relations having brought too scanty a supply of firewood.' In this document we also find a recommendation 'that a cinerator be erected at the burning-ghât, which would be at the disposal of the poor on the payment of a small fee. By this means the Hindoo community would get accustomed to it, and would see its advantage. A body would be put in at one end of a closed vessel, which in its transit through the cinerator would be exposed to intense heat, and after a certain time drawn out and opened. The ashes of the deceased would alone remain, which could be carried away and kept.'

As it may prove interesting to some reader, I will now give a description of a cremation ceremony of the very highest class, as performed in Siam, in which country, as has been stated elsewhere, only those dead are buried whose survivors cannot pay the fees of the priests. It is said to be from the pen of a lady¹ who was a resident for several years in that country, and is an extract from a paper of hers which appeared in a late number of 'Lippincott's Magazine.'

¹ F. A. Feudge.

Burning is now, and has been for centuries, the universal custom in Siam—preferred, it is supposed, because of the facility it affords for removing the precious dust of the loved and lost. In old, aristocratic houses I have seen arranged in the family receptacle massive golden urns, containing the ashes of eight, ten, or twelve generations of ancestors; and these are cherished as precious heirlooms, to descend through the eldest male branch.

The time, expense, and character of a burning depend mainly on the rank and wealth of the parties, though the ceremony is always performed by the priests, and always within the precincts of a temple. The only exception is in seasons of epidemics or when the land is laid waste by famine. Among the better classes the dead body is laid unmutilated, save by the removal of the intestines, in a coffin, and it is more or less carefully embalmed, according to the time it is to be kept. If the deceased belonged to a private family of moderate means, the burning takes place from four to six days after death; if he was wealthy, but not high-born, the body may be kept a month, but never longer, while the remains of a noble lie in state from two to six months, according to his rank; and for members of the royal family a still longer period intervenes between the death and the burning. But, whatever the interval, the body must lie in state, and the relatives make daily prostrations, prayers, and offerings during the whole time, beseeching the departed spirit to return to its disconsolate friends.

When the time for the funeral has arrived, the body is laid in a receptacle on the summit of a stately pyramid, the form and material of which indicate the wealth and position

of the deceased. It is thickly gilded, and the receptacle lined with plates of solid gold when the body has belonged to one of royal lineage and well-filled coffers. The last is quite as essential as the first to a gorgeous Oriental funeral, since for rank without money an East Indian has ever the most profound contempt.

Both requisites were fortunately united in the person of the queen-mother of King Pra-Nang-Klau. At the funeral of this aged queen there was such a display of Oriental magnificence as rarely falls to the lot of Western eyes to witness. The embalmed body lay in state under a golden canopy for eight months; the myrrh, frankincense, and aromatic oils used in its preparation cost upwards of one thousand pounds, and the golden pyre above twenty thousand. The hangings were of the richest silks and velvets, trimmed with bullion fringe and costly lace, and the wrappings of the body of pure white silk, embroidered with pearls and precious stones. Incredible quantities of massive jewellery decked the shrunken corpse, and a diadem of glittering gems cast its prismatic radiance over the withered features. Tiny golden lamps, fed with perfumed oil, burned day and night around the pyre, while every portion of the vast saloon was decorated with rare and beautiful flowers, arranged in all the various forms of crowns, sceptres, temples, angels, birds, lanterns, wreaths, and arches, till Flora herself might have wondered at the boundless resources of her domain. Day and night musical instruments were played, dirges wailed forth, and prostrations perpetually performed; while twice every day the king, attended by his whole court, made offerings to the departed spirit, beat his breast, tore his hair, and declared life 'utterly unendurable without the beloved one.'

All this was kept up for eight months, and then the scene changed for one of festivity. For thirty days, during most of which time I was present, there was a succession of *levées*, concerts, and theatricals, with feats of jugglery, operas, and fireworks; and then the embalmed body, surrounded by perfumes and tiny faggots of sandal-wood, was consumed by fire, and the ashes collected by the high-priest or his deputy in a golden urn, and deposited, with other relics of royalty, in the king's palace.

How very different from the above is a cremation amongst the North American Indians (the Cocopa tribe), on the Colorado river! Here is an account of one published in a late New York paper by an eye-witness, Professor Le Conte.

A short distance from the collection of thatched huts which composed the village, a shallow ditch had been dug in the desert, in which were laid logs of the mezquite (*Prosopis* and *Strombocarpus*), hard and dense wood, which makes, as all Western campaigners know, a very hot fire with little flame or smoke. After a short time the body was brought from the village, surrounded by the family and other inhabitants, and laid on the logs in the trench. The relatives, as is usual with Indians, had their faces disfigured with black paint, and the females, as is the custom with other savages, made very loud exclamations of grief, mingled with what might be supposed to be funeral songs. Some smaller faggots were then placed on top, a few personal effects of the dead man added, and fire applied. After a time a dense mass of dark-coloured smoke arose, and the burning of the

body, which was much emaciated, proceeded rapidly. I began to be rather tired of the spectacle, and was about to go away, when one of the Indians, in a few words of Spanish, told me to remain, as there was something yet to be seen. An old man then advanced from the assemblage, with a long pointed stick in his hand. Going near to the burning body, he removed the eyes, holding them successively in the direction of the sun, with his face turned towards that luminary, repeating at the same time some words which I understood from our guide were a prayer for the happiness of the soul of the deceased. After this, more faggots were heaped on the fire, which was kept up for perhaps three or four hours longer. I did not remain, as there was nothing more of interest, but I learned on inquiry that after the fire was burned out it was the custom to collect the fragments of bone which remained, and put them in a terra-cotta vase, which was kept under the care of the family.

From these old-world practices—for they are old-world practices, although performed at the present day—we will now turn aside to examine into the modern and improved systems of cremation. The extracts which I shall make will be mostly from the work of Dr. De Pietra Santa.¹ First of all come the experiments made by Dr. Polli at the gas works in Milan.

In a cylindrical retort of refracting clay, used for the distillation of coal-gas, was placed the body of an unfortunate poodle dog, drowned for contravention of the muzzle laws

¹ The descriptions of Dr. Santa are so admirably translated in 'Iron,' that I quote from that paper nearly in full.

promulgated by the police. The dog weighed twenty-two and a half pounds. The apparatus was heated by a crown of flames issuing from a perforated circular tube. In order to render combustion as active as possible, the coal-gas was mixed with a certain quantity of pure air. Our readers will recollect this addition of atmospheric air is the principle of the Bunsen burner, which ensures perfect combustion of coal-gas, and produces a maximum of heat with a minimum of light. The cremation lasted several hours, producing a thick smoke, &c. After carbonisation, the skilful chemist succeeded in obtaining complete incineration, that is to say, the calcination of all the solid parts of the body, which weighed one pound fourteen-and-a-half ounces.

Satisfied with the result of this experiment, which proved the possibility of reducing the carcase of an animal to ashes by ordinary coal-gas, Dr. Polli proceeded with a second and more complete experiment. One improvement was the disposition of a vertical retort in such manner as to consume the gaseous products of combustion. This is easily effected by placing at the upper orifice of the retort a second ring of gas jets. On this occasion better arrangements were made for carrying out the principle of the Bunsen burner, with the result of producing the complete incineration of a dog weighing forty-two and three-quarter pounds in the space of a couple of hours. On this occasion the solid residue weighed only two pounds and some ounces.

Few have given more time and study to practical cremation than Professor Brunetti. This gentleman sent a case of apparatus to the Vienna Exhibition, and records his conviction—arrived at after five experiments upon human bodies—that the total incineration of a corpse and the com-

plete calcination of the bones by fire is, under ordinary conditions, impossible. He has tried various combustibles, gas retorts, closed vessels, and the open air, and has arrived at the conclusion that special apparatus is indispensable to the success of any attempt at perfect cremation. His apparatus consists of an oblong furnace built of ordinary, or, still better, of refracting brick, and furnished with ten side openings, in order to give the power of regulating at will the draught, and consequently the intensity of the fire. In the upper part is a cornice of tiles, destined to support an iron framework, above which is the dome-shaped roof, furnished with cast-iron shutters, which may be opened or closed by means of regulators, to shut in the flame and concentrate the heat. The body to be incinerated is placed upon a thin metallic plate, suspended by stout iron wire. The operation may be divided into three sections. Firstly, the kindling of the body; secondly, its combustion; thirdly, the incineration of the soft parts, and the calcination of the bones. Wood having been piled up in the furnace and lighted, the body catches fire at the end of half an hour. A considerable quantity of gas is now evolved, and the moveable shutters come into operation. The body then burns freely, and, if the pile of wood have been deftly arranged, complete carbonisation ensues at the end of a couple of hours. The shutters are then opened, another sheet of metal is lowered over the carbonised mass to concentrate the heat still more, and the wood is renewed. By means of this apparatus, and at the cost of 160 or 180 lbs. of wood, complete cremation is achieved in two hours more. When the furnace is cold, the residue is collected and placed in a funereal urn. The last experiment of Dr. Brunetti was

made upon the body of a man who died, at the age of fifty, of chronic bronchitis.

A description of a Siemens apparatus as constructed for use in Germany is given by Professor Reclam in an article entitled 'Die Feuerbestattung' in the 'Gartenlaube.' A sketch of it in action, partly copied from this article, is given in Plate I.

It consists of (1) a gasometer for the manufacture of the gas necessary to heat the furnace; (2) the furnace itself, with a regulator and a space for burning; (3) a chimney to take away the smoke &c. We may conceive a large, beautiful dead-house built for the purposes of cremation. In the midst, but invisible to those present, is a furnace. The funeral procession arrives at the house, and enters it the same as the churchyard is now entered. When the coffin has been placed on the tressel, and the usual ceremony ended, it is let down into the grave and disappears. In a short time after it is let down the covering of the furnace is removed, and replaced when it has received the coffin.

The process of cremation is effected by means of heated air. The gasometer is put in action by the consumption of coal, charcoal, peat, or wood. The gas thus produced is conducted through a pipe provided with a regulating-valve, where, meeting with a stream of air, also under regulation, it is converted into a flame. This flame extends through the room which has the regulator, so that the brick material which is piled up there is heated to white heat, and kept to this. The flame still continuing, supplies heat till the furnace or place for the reception of the body is

heated to a weak red heat, when the flame escapes through a pipe into the chimney.

As soon as the furnace is in the condition thus described, the process of cremation goes on. The covering of the furnace is removed by the man who superintends the burning of the bodies. It is put back again, and the body subjected to the action of the red heat for a longer or a shorter time, according to its physical condition. After this is done the gas-valve is closed, and the air in consequence goes through the regulator into the place for burning. It is here heated in the regulator nearly to red heat, in which condition it comes to the bodies already, in some measure, dried, so that decomposition soon follows. The bones are decomposed by the action of the heat, while the carbonate dissolves, and the lime remains as dust. To collect this dust an instrument is provided, that it may be placed in a jar, or any other vessel, and preserved by the relatives of the deceased.¹

The most perfect apparatus, however, yet devised for the reduction of a body to ashes is that adopted by Sir Henry Thompson. From his work upon cremation I take the following description, which will be always studied with interest. This extract will fitly conclude these quotations.

A powerful reverberating-furnace will reduce a body of more than average size and weight, leaving only a few white and fragile portions of earthy material, in less than one hour. I have myself personally superintended the

¹ From a translation in the 'Saturday Journal.'

burning of two entire bodies, one small and emaciated, of 47 lbs. weight, and one of 144 lbs. weight, not emaciated, and possess the products—in the former case weighing $1\frac{3}{4}$ lb.; in the latter, weighing about 4 lbs. The former was completed in twenty-five minutes, the latter in fifty. No trace of odour was perceived—indeed, such a thing is impossible—and not the slightest difficulty presented itself. The remains already described were not withdrawn till the process was complete; and nothing can be more pure, tested by sight or smell, than they are; and nothing less suggestive of decay or decomposition. It is a refined sublimate, and not a portion of refuse, which I have before me. The experiment took place in the presence of several persons. Among the witnesses of the second experiment was Dr. George Buchanan, the well-known medical officer of the Local Government Board, who can testify to the completeness of the process.

In the proceeding above described, the gases which leave the furnace-chimney during the first three or four minutes of combustion are noxious; after that they cease to be so, and no smoke would be seen. But these noxious gases are not to be permitted to escape by any chimney, and will pass through a flue into a second furnace, where they are entirely consumed; and the chimney of the latter is smokeless—no organic products whatever can issue by it. A complete combustion is thus attained. Not even a tall chimney is necessary, which might be pointed at as that which marked the site where cremation is performed. A small jet of steam, quickening the draught of a low chimney, is all that is requisite. If the process is required on a large scale, the second furnace could be utilised for cre-

mation also, and its product passed through another, and so on without limit.

This plan, however, has been thrown into the shade by subsequent experiments:—

By means of one of the furnaces invented by Dr. Wm. Siemens, I have obtained even a more rapid and more complete combustion than before. The body employed was a severe test of its powers, for it weighed no less than 227 lbs., and was not emaciated. It was placed in a cylindrical vessel about 7 feet long, by 5 or 6 feet in diameter, the interior of which was already heated to about 2,000° Fahr. The inner surface of the cylinder is smooth, almost polished, and no solid matter but that of the body is introduced into it. The product, therefore, can be nothing more than the ashes of the body. No foreign dust can be introduced, no coal or other solid combustible being near it: nothing but heated hydrocarbon in a gaseous form, and heated air. Nothing is visible in the cylinder before using it—a pure, almost white, interior—the lining having acquired a temperature of white heat. In this case the gases, given off from the body so abundantly at first, passed through a highly-heated chamber, among thousands of interstices made by intersecting firebricks, laid throughout the entire chamber, lattice-fashion, in order to minutely divide and delay the current, and expose it to an immense area of heated surface. By this means they were rapidly oxidised, and not a particle of smoke issued by the chimney; no second furnace, therefore, is necessary by this method to consume any noxious matters, since none escape. The process was completed in fifty-five minutes; and the ashes, which weighed about 5 lbs., were removed with ease.

After such brilliant results—results at once expeditious, cleanly, and economical—well might Sir Henry Thompson challenge Mr. Holland¹ ‘to produce so fair a result from all the costly and carefully managed cemeteries in the kingdom,’ and safely might he even offer him twenty years ‘in order to elaborate the process.’

An ordinary Siemens’ regenerative furnace for cremation makes use of only hot blast, it being considered that the organic substance to be consumed would supply sufficient hydrogen and carbon, and that only hot air is required to produce excellent results. But a perfect apparatus would be constructed upon the principle exhibited in Plate II., which represents the cremation apparatus devised by Dr. C. W. Siemens, F.R.S., of Westminster.

The body to be reduced to its elements is placed in the chamber A (fig. 1), which is iron-cased and lined inside with a substance able to resist the highest temperature. Figs. 1 and 2 represent the consuming arrangement, which may form a portion of the chapel itself. Figs. 3 and 4 show the gas-producer, where the gaseous fuel is produced, and this may be situated at some distance from the building where the cremation is performed. These gas-producers are not only separate from the cinerator, where the heat is

¹ Medical Inspector of Burials for England and Wales.

required, but may be multiplied or extended, so as to supply any number of cinerators, and so separately reduce a plurality of bodies. At the back of the heating chamber A are placed four firebrick-celled regenerative chambers for gas and air, seen in section at fig. 2, and these work in pairs. The gas carried from the gas-producer is directed into the gas regenerator, and the entering air into the air regenerator, and in these regenerators both gas and air are heated, attaining a temperature equal to a white heat before they reach the chamber A in which the body is laid. The heated air, after passing upwards through the regenerator, enters the consuming chamber at B, and the heated gas enters it at c. They thus enter the chamber separately, and with a sufficient velocity to impinge against the door of the chamber; but when they meet at the point D in the chamber, the gas and air mingle and add to the carried heat that due to the mutual chemical action. The result is a devouring flame. One pair of regenerators are always employed in conducting the heated air and gas into the chamber A, whilst the other pair are employed in carrying away the combined gases or expended fuel to the chimney. This expended fuel is nevertheless an immensely hot flame, and on its way to the chimney it proceeds downwards through one pair of the regenerators, the upper portion of which it

heats intensely. Nearly the whole of the heat of the expended fuel is left in the regenerators, and the smokeless gases which enter the chimney to be cast into the air rarely exceed 300° Fahr. By means of valves the regenerators and air-ways which were carrying off the expended fuel, can be instantly used for carrying air and gas into the reducing chamber, and the heat left in them consequently utilised. Not only is a saving of 50 per cent. in fuel thus effected, but the noxious gases from the body would be entirely consumed in their passage down through the regenerators.

The gas-producer itself (figs. 3 and 4) works in the following manner:—The coal is supplied to the charging-box E every three hours or so, and slides down an inclined plane, the upper portion of which is solid and covered with firebricks. Upon this sloping bed the fuel is heated, and its volatile constituents are liberated, just as in a gas retort, leaving about 60 per cent. of carbonaceous matter, the complete combustion of which is brought about by the air which enters through the open part of the grate at the foot of the sloping bed. More carbonic acid gas is now evolved, and this non-combustible gas passes through the red-hot fuel, taking up in its passage another equivalent of carbon, and so becoming an inflammable gas, or what is called carbonic

oxide. Should it be considered advisable to make use of steam, each cubic foot of which yields as much inflammable gas as five cubic feet of air, a pipe of water is allowed to run at the foot of the grate, and is there converted into steam by the radiant heat. The combustible gases now pass into the main gas flue, and inasmuch as this gas flue must contain an excess of pressure above the exterior air, so as to prevent the inroad of atmospheric air into the gas flue, and consequent partial combustion, the gas is allowed to rise—which it will do by its initial heat—some score of feet above the producers, and is carried horizontally through the wrought iron tube F into and then down into the furnace. The flat-lying tube being exposed to the air causes the gas in its passage through it to lose about 200° Fahr. of temperature, which increases its density, adds weight to the descending column of gas, and presses it on to the furnace. One estimable feature in this system of gas-producing is that the production can be arrested for half a day without deranging the producer, the fuel and brickwork being sufficiently bulky to maintain a dull red heat for that period. Air cannot enter the grate unless the gases given off in the producer are withdrawn to the furnace; and when the gas valve of the furnace is reopened, the production of the gases is once more continued.¹

¹ For a scientific description of the patent regenerative gas furnace

It has been urged against cremation by sentimentalists, that if the burning could be observed in even an improved apparatus, the process would prove a harrowing one, recall in fact to mind the horrors described by the Comte de Beauvoir in his Indian reminiscences.¹ But no such thing would result, for whilst being consumed the body would remain of itself perfectly motionless and without visible contraction or convulsion. Several late human cremations which have taken place in the Siemens Works in Dresden, have been purposely witnessed by eminent scientific men and others, through the glass panel of the door

which took the prize medal at the London Exhibition of 1862 and the *grand prix* at the Paris Exposition of 1867, see the 'Journal of the Chemical Society' for July 1873; the lecture delivered by the late Professor Faraday at the Royal Institution on June 20, 1862; and the description published by Dr. Siemens, London, 1874.

The minimum cost of a *complete* establishment for cremation upon the foregoing model, i.e., for the furnace and gas-producer as given in Plate II., but not including a mortuary building, would be as under :—

	Furnace	Gas-producer
	£	£
Ordinary brickwork about	40	30
Fire brickwork "	230	30
Lime, sand, fireclay, &c. . . . "	35	10
Cast iron "	100	30
Wrought iron "	60	20
Valves, regulators, levers, &c. . . . "	50	10
Timber "	5	—
Cooling tube, &c. . . . "	—	50
Chimney, &c. . . . "	—	100
Total 800 <i>l.</i> ; add freight and contingencies.		

¹ ' Voyage autour du Monde.'

which is always provided for the use of the manufacturing operator, and the utter absence of anything which could prove in the least distressing to the mind, the eye, or the imagination, is vouched for by all. The current of combined air and gas simply plays upon the body with a transparent flame, until the whole becomes incandescent. There is not even the least effluvium. In a late experiment, when nearly a quarter of a ton of animal matter underwent cinerary treatment at Dresden, the gases between the flue and the chimney proper were intercepted by an aspirator, and found perfectly inodorous.¹ Once incandescent, the body soon assumes a hue of translucent white, and then speedily crumbles into ashes.

The quantity of ashes left from a body of average weight has been foretold by Sir Henry Thompson almost to the fraction of a pound. There is no doubt whatever also that the time named by him as sufficient for entire reduction will be borne out in practice. As regards the cost of cremation, Sir Henry is most assuredly correct in lauding its economy over interment. The cost of the fuel expended during the last three cremations in Germany did not exceed 3s., plus of course the percentage to be charged for attendance, and for the use of the apparatus, which latter would

¹ For full details of the carbonisation, see the 'Morning Advertiser,' Oct. 20 and Nov. 15, 1874, and the 'Morning Post,' Nov. 13, 1874, which contain translations from the German press.

be trifling were it in constant use. When the clerical fees and all the costs of conveyance, &c., are added thereto, the whole sum would not necessarily exceed that of a seventh-class funeral in London.¹

Place of cremation	Date	Sex	Age	Weight of body, about	Weight of ashes of body	Cost of fuel	Time of cremation	Authority
				lbs.	lbs.	s. d.	min.	
Padua .	Mar. 10, 1869	female	35	116	6	—	—	Brunetti
" .	Jan. 20, 1870	male	45	99	3.06	—	—	"
" ² .	May 15, 1870	"	50	90	4.06	2 4	85	"
Breslau ³ .	Sep. 22, 1874	female	aged	70	3	3 0	70	'Tageblatt'
Dresden ⁴ .	Oct. 9, 1874	"	26	—	3.75	—	75	F. Siemens
Same apparatus ⁵	Nov. 6, 1874	"	23	—	6 lbs. (with wood coffin)	—	78	"

The above Table represents the details of six recent human cremations.⁶

¹ About 6*l.*

² Three other experiments were made upon human remains by Dr. Brunetti, with nearly similar results.

³ An emaciated corpse from the town hospital.

⁴ Wife of an English baronet.

⁵ Wife of a South German physician.

⁶ In case any reader would like to compare the above results with those derived from the cremation of the lower animals, I append the following recent instances variously treated.

Place of cremation	Subject	Weight of corpse	Weight of ashes	Time occupied	Authority
Milan .	dog	lbs. 22.50	lbs. 1.85	min. —	Dr. Polli
" .	"	42.75	2.12	120	"
" .	two dogs	53	2	360	Dr. Teruzzi
London .	pig	47	1.75	25	Sir H. Thompson
" .	"	144	4	50	"
Birmingham	"	227	5	55	"
Dresden .	horse	202	16	—	Dr. Reclam
" .	"	460	23	240	"

The cost for fuel, in even this last huge experiment, did not exceed 4*s.*

The body to be burnt would, in the first instance, soon after death¹ be placed, perhaps, in a coffin of some light material, and taken in due time to the mortuary,² ready for conveyance to the 'cinerator.' And, as it is very desirable that the ashes of the body should be kept separate from those of any coffin, a shroud of some imperishable material will be carefully sought after by inventors. The ancient Greeks made use of sheets of asbestos, which is a fibrous form of hornblende;³ and those of the Egyptians who performed cremation enclosed the body in a receptacle of amianth, which is a similar incombustible mineral substance.⁴ Whether these materials will resist the intense heat of the Siemens apparatus remains to be seen; for I have had no opportunities of making experiments. Wood, at all events, is likely to be rejected, on account of the

¹ When the body has to be conveyed for a very long distance to the place of cremation, it might be necessary to practise some simple method of embalming, and this any surgeon is capable of performing. In the case of the English lady who was recently taken to Dresden, Mr. Garstin of London was resorted to.

² There is no doubt that public mortuaries will soon be established throughout the country, as in some parts of the Continent and in some large English towns now. Sanitary science calls aloud for their establishment generally, and the practice of permitting the dead to remain in the habitable rooms of the poor has proved very repugnant to decency and inimical to public health.

³ The princes of Tartary use this mountain silk, as it is called, even now.

⁴ Frazer.

residue of carbon, &c. (charcoal), which might not be easily separated from the more precious relics. Lead would be equally objectionable, for, although easily fusible, it possesses certain disadvantages easily to be imagined. In all probability the most suitable material for the inner coffin, which alone is to be submitted to the impingement of the hot blast, will be zinc. This metal would entirely disappear in the fierce heat, the reason being that it is volatile, and would distil off—its boiling-point being 800° Cent.,¹ or 500° Fahr. below the minimum temperature which will reign in the chamber of the apparatus.

The English and the German machinery for the reduction of the body to ashes vary in a few particulars, but the general construction is the same, as will have been perceived. In one Dresden arrangement the body is lowered into a receiver below, and the idea of interment is thus in a manner preserved.² In the English arrangement this is otherwise, and the coffin is made to gradually slide into the receiver, like a ship launched into water. The anguish induced by the moment of departure is in this way somewhat ameliorated, as there is no noise of lowering-machinery to grate upon the ear. At certain appointed words in our beautiful funeral service—for instance, ‘ashes to ashes’—a curtain might

¹ Wanklyn.

² See Plate I.

be partially withdrawn, and the body, encased in a suitable shell, would gravitate slowly into the chamber of the apparatus, which would then immediately close noiselessly; to be opened only after the due reduction of the body. The utmost privacy would be insured, and no strange eyes could gaze upon it¹ during the period of incineration. The funeral service could also be made to occupy the whole of the time necessary for sublimation if it were so desired, or a eulogy or other reference to the departed might form the subject of a discourse. The ashes could afterwards be collected, and reverentially placed in an urn,² or other suitable receptacle, and conveyed to their last resting-place. Plate III. represents a view of a mortuary chapel, such as would probably be required in a Christian cemetery; and the scene there represented will serve to show how completely decorous the procedure would be.³ And one may here remark that the great advances made by science can nowhere better be evidenced than by a com-

¹ At the cremation of the body of an English lady at Dresden in October last, arrangements were made for observing the progress of combustion, and this was permitted under the peculiar circumstances. It is not however intended anywhere to practise even a partial exposure, nor would the English pattern of cinerator permit it. When the time needful for reduction has been accurately calculated, such exposure will be unnecessary. With the improved apparatus half an hour will probably be sufficient.

² A cubic space of six inches would accommodate the ashes of the strongest man.

³ This drawing was kindly made for me by my friend Mr. E. F. C.

parison between the modern and ancient systems of cremation. However well disguised in beautiful language—as, for instance, by Bulwer in the ‘Last Days of Pompeii’—the barbarity of the method practised in classical times will be sensibly felt in the background.

It is likely enough that whenever cremation is again practised, urns will form the chosen receptacles of the ashes. Vases or urns have always been associated with sepulture in classical times. The finest vases which have come down to us from antiquity were not originally intended for sepulchral purposes, but for the adornment of the mansion. Frequently, however, these were deposited in the tombs along with the unburnt body,¹ as being the objects most valued by the deceased when living. The survivors doubtless held it as sacrilegious to make use of these favourite objects, for they are found unmolested even now.

It is worthy of remark that amongst the Ojibois Indians of the present day the canoe, gun, and blanket, which are laid upon the grave of each one

Clarke, architect, of London, whose pencil has also furnished me with the sketch of the family columbarium in Plate V.

¹ The tombs in Magna Græcia and Etruria were subterranean ones, the body being laid upon the ground, and around it were placed the painted vases. The tombs were made to bear as much resemblance as possible to the abodes of the living, and the walls were frequently painted with scenes from the upper world.

of the tribe, although newly purchased, are never made use of again, nor ever stolen.¹ Many other Indian tribes observe the same custom;² and the Moldavians and the Caubees as well.³

The custom of depositing the painted vases in tombs ceased about the time when Italy and Sicily fell completely under Roman dominion. The Romans, who burnt their dead, deposited their ashes in urns, as we have seen. No ashes, it may be said generally, have been found in the Greek tombs of Italy, but the Romans made use of the vases found in tombs made by the Greeks there, as cinerary urns for their dead; and this appropriation was not uncommon. In the case of a member of the Roman family of Claudia an ancient Egyptian vase, now in the Louvre, was utilised in this manner.

The ancient painted vases are now divided into six classes, embracing forty-nine various shapes.⁴ The styles are also divided into Early or Egyptian, Archaic Greek, Severe or Transitional, Beautiful or Greek, Florid, and into those of the Decadence period. Should cremation be extensively adopted nowadays, it is not unlikely that all these forms and styles will be laid under contribution. A friend⁵ has kindly

¹ A. P. Reid.

² Nicolo di Coti.

³ J. E. Price.

⁴ H. M. Westropp.

⁵ The artist, Mr. J. E. Newton, an exhibitor at the Royal Academy of 1874. I have engraved a few of his designs.

drawn for the present work a dozen urns, adapted for the reception of human ashes (*see* Plate IV.). Fig. 1 is Archaic in shape; fig. 3 belongs to the Perfect or Beautiful forms; and fig. 2 represents a shape often used during the Florid era. The others are original designs based upon classic lines, but not referable to any one period. Some very elegant forms of the ancient vases, copied from gems and other archæological resources, are to be found embodied in the monuments of the churchyards and cemeteries of the present day.¹

Had the practice of cremation followed uninterruptedly down to our times, the receptacles for the ashes would doubtless have been shaped according to the prevailing taste of each period of architecture. For instance, the genius of the Semicircular style, which prevailed from the sixth to the twelfth centuries, and embraced the Anglo-Saxon and Norman periods, would have left its own peculiar mark, just as it has done upon the fonts which were sculptured during its sway. The Early Pointed, the Geometrical, and the Decorated and Late or Perpendicular Gothic periods would, in a similar manner, have influenced the

¹ The above remarks do not refer to those monster urns in which the whole body was entombed unburnt. Some of these measure six feet in length and four and a half feet in width. One found at Dardanus was able to accommodate six persons. See the 'Illustrated London News' of April 26, 1856.

symmetry of the vases produced between the twelfth and fifteenth centuries, and contributed their own quota of beautiful shapes. And, speaking generally, ecclesiastical taste, which presided over every detail of church construction down even to the piercing of the keys, would have been as easily recognisable in the vases which contained the ashes of the dead.

It is impossible to prophesy in what direction the taste of the future may wander as regards the shape of cinerary vessels, but there can be no doubt whatever that in many instances they will assume a distinctly ecclesiastical character. The classic patterns of vases and urns would be in excellent keeping with the architecture of churches built after Greek and Roman models; whilst they might appear otherwise if exposed to view in the niches of the walls of a Gothic fane. But it may fairly be predicted that the architectural style of the church will have to bow to the varying tastes of the worshippers, and just as we see in Westminster Abbey—that beautiful example of the Early Pointed style—the utmost diversity of taste in the monuments which cluster upon its walls, so the walls and vaults of our churches must necessarily accommodate every type of fancy whenever cremation resumes its sway. Cinerary vessels, in accordance with revived mediæval taste, will probably predominate. Some, it may be, will even assume the shapes of ancient

reliquaries.¹ There is no reason why these vessels should not vary, in material and design, with the taste or means of the relatives. Glass, precious metals, and even gems, might with propriety be introduced. Urns of gold and silver were not uncommon in ancient times, and are even yet used in Siam.

With reference to the material of which cinerary urns were formerly made, pottery was chiefly chosen on account of the facility of manufacture, but they were frequently constructed of marble, alabaster, and glass. Perhaps the most beautiful cinerary urn in the world was the Barberini or Portland vase, now in the British Museum, and which contained the ashes of the Emperor Alexander Severus. It was made of blue glass upon which a coating of white glass was overlaid, and the latter cut cameo fashion into a number of emblematical figures. Glass was frequently adopted in Italy for cinerary urns, and will probably be the favourite material once more.

Besides the placing of the ashes of the dead in urns, use was frequently made of small stone sarcophagi, and these latter are found in several of the ancient Greek burial-grounds in Anatolia. This will possibly be the form adopted in the future, should an interment of the ashes be chosen in preference to their

¹ My friend Mr. Clarke has very kindly sketched, in elucidation of this view, the vessels shown in the family mausoleum sketched in Plate V.

ennichement. But this is not to say that urns are not equally suitable for laying in the earth if constructed with that view. Probably both forms of containing vessels will be patronised, just as was the case in olden times. In ancient Dardanus stone sarcophagi are commonly found, whilst at Batak, nearer the supposed site of Troy, urns only were discoverable; and yet the ornaments upon the smaller articles of pottery, found in both sarcophagi and urns, were identical in pattern, as far as I can recollect.¹

The cinerary urns of the Romans were for the most part at one time placed in underground vaults, the walls of which were pierced with arched recesses for their reception, and, from the resemblance of the numerous niches to a collection of pigeon-holes, the place was called a *columbarium*. Two fine columbaria can be seen at Rome, one in the Vigna Codini and another in the Villa Doria. Should this system of storing away the cinerary urns be adopted in our churches, the crypts would for the most part resemble the sketch given in Plate VI., which is an enlargement and rearrangement of the columbarium given in Westropp's 'Handbook of Archæology.' There can be no doubt that this will prove the most popular method of disposing of the urns in modern cities where

¹ Numbers of these relics were dug up at both places, in 1855 and 1856, by Mr. Spencer Wells, Dr. Kirk, Mr. Calvert, Mr. Brunton, myself, and others.

cremation is about to be practised. The catacombs in our cemeteries, or what pass as such, will also admirably enshrine the urns. It is not at all unlikely that in some instances the walls of the churches themselves will in future be constructed so as to receive the remains, and bear some sort of resemblance to the famous church at Cologne where the osteological relics are placed around the fane.¹ But in the case of urn sepulture the appearance would be far more æsthetical. In all probability the wall spaces would be apportioned out into family receptacles, and the orifices closed with suitable metal gratings ornamentally treated. I have furnished an imaginary view of this kind of treatment at the upper part of Plate VI.

My task is now completed; but before I lay down the pen I would say to those who are desirous of promoting the cause of cremation, Do so, within due bounds, fearlessly. Do not believe that the practice is in any way opposed to religion, for such a belief has no anchorage in truth. And in order, to practically bring nearer to us the time when our much-enduring mother earth shall no longer be systematically poisoned, all those who are favourable to the institution of cremation should forthwith put

¹ The church of St. Ursula; the bones are said to be those of the Eleven Thousand Virgins.

into writing their desire that their remains shall not be buried, but shall be consumed according to the method of cremation best attainable.

If every individual promoter, male or female, of fifteen years old and upwards—without reference to the possession of property in any way—would, in view of the uncertainty of life, place such a request in his or her writing-desk, cremation would speedily prevail. The change from burial will otherwise be a protracted one, since few persons have enough strength of mind to run counter to the general custom, fearing the indignation of other relatives of the deceased. The weakest persons, however, have still a greater repugnance to doing anything contrary to the expressed wishes of the dead. If, therefore, such a wish can be exhibited, it will not only, as a rule, be religiously complied with, but all friends, whatever their own opinions, will be amply satisfied.¹

¹ This is urged by Mr. Baker, the author of the 'Laws relating to Burial,' in a letter addressed to me.

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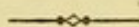
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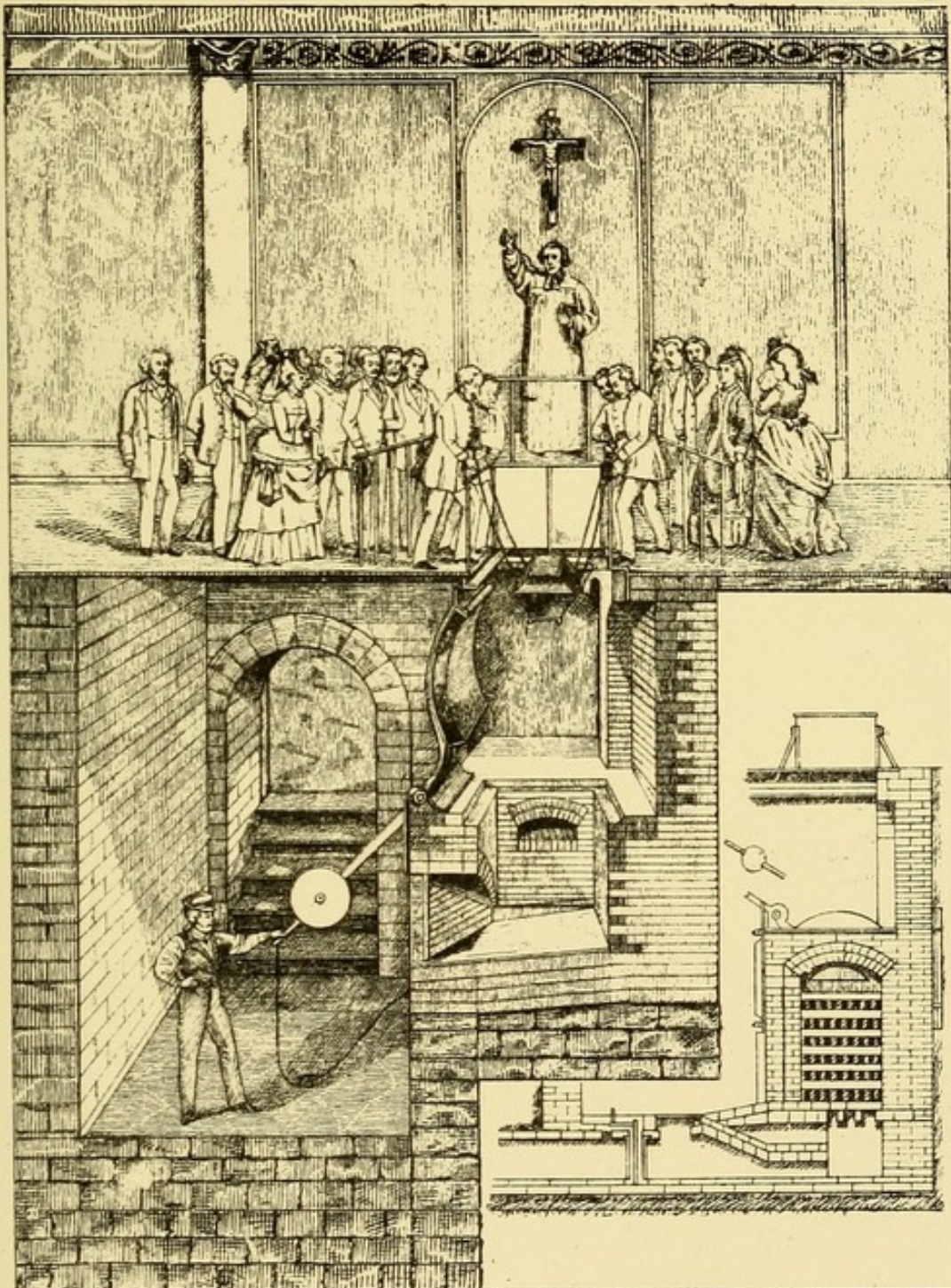
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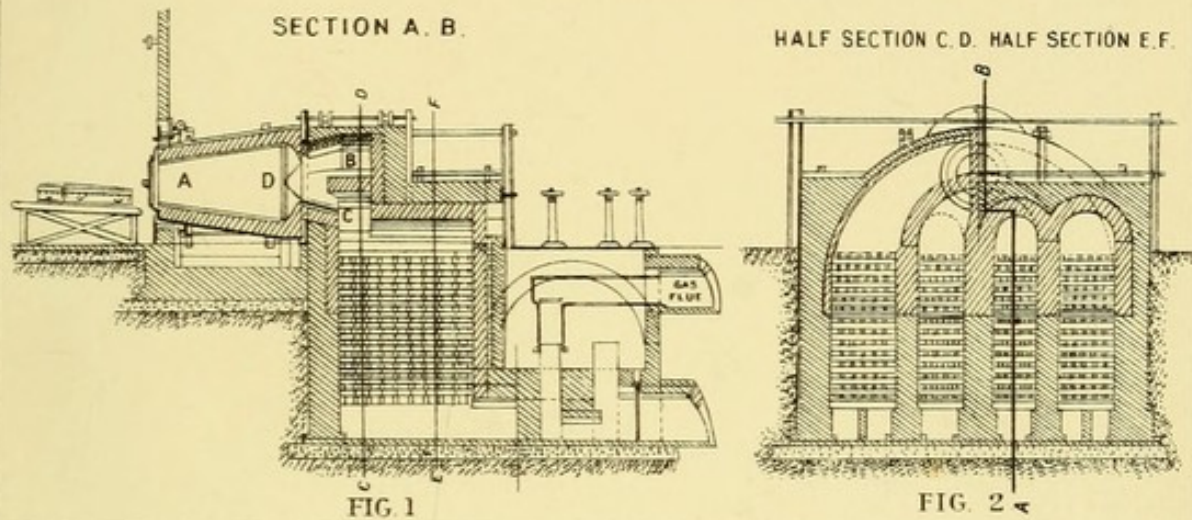
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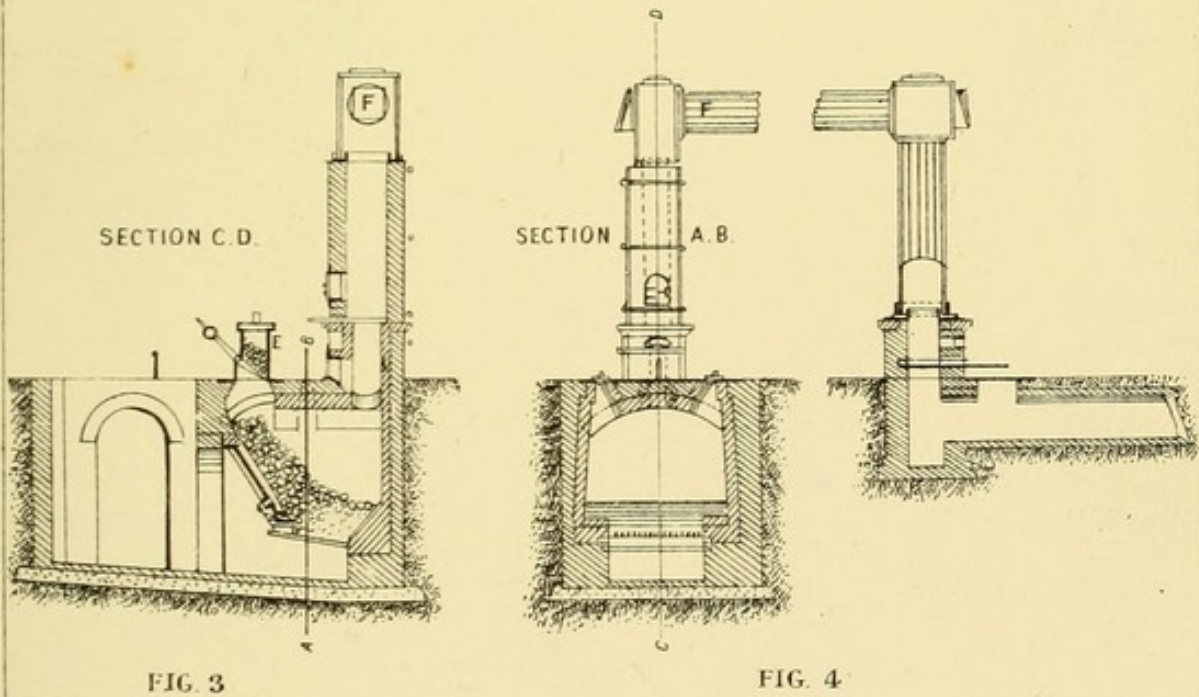
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VIEW OF A SIEMENS' APPARATUS (GERMAN)

FURNACE



GAS PRODUCER



Engraved by Frost, J. Copp & Rowland Carter, Chiswick & Westminster.



From the sketch by Miss J. C. & H. C. Clarke, Esqrs. & H. C. Clarke, Esqrs.

E. F. C. Clarke Del.

SKETCH OF MORTUARY CHAPEL.

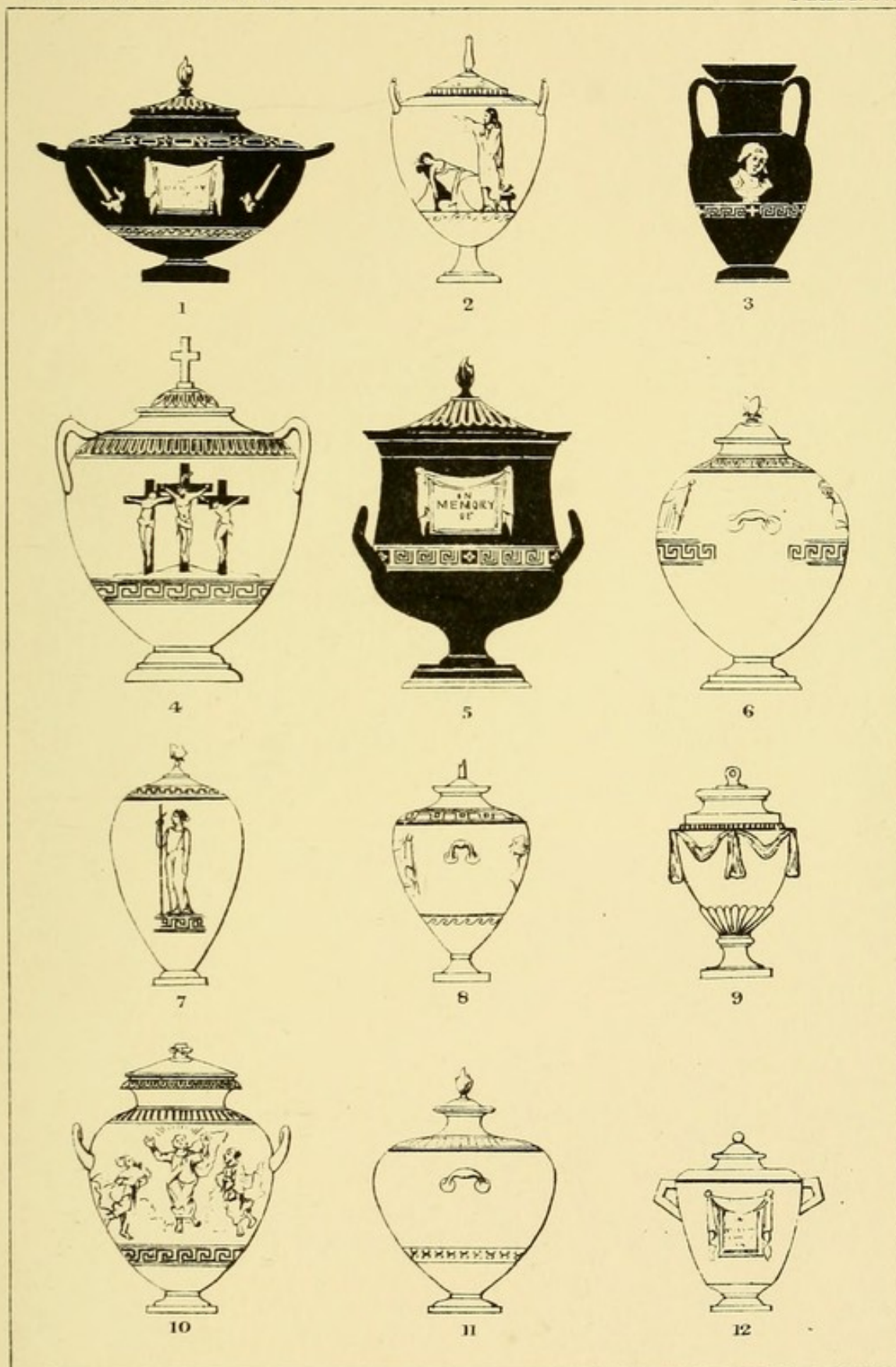
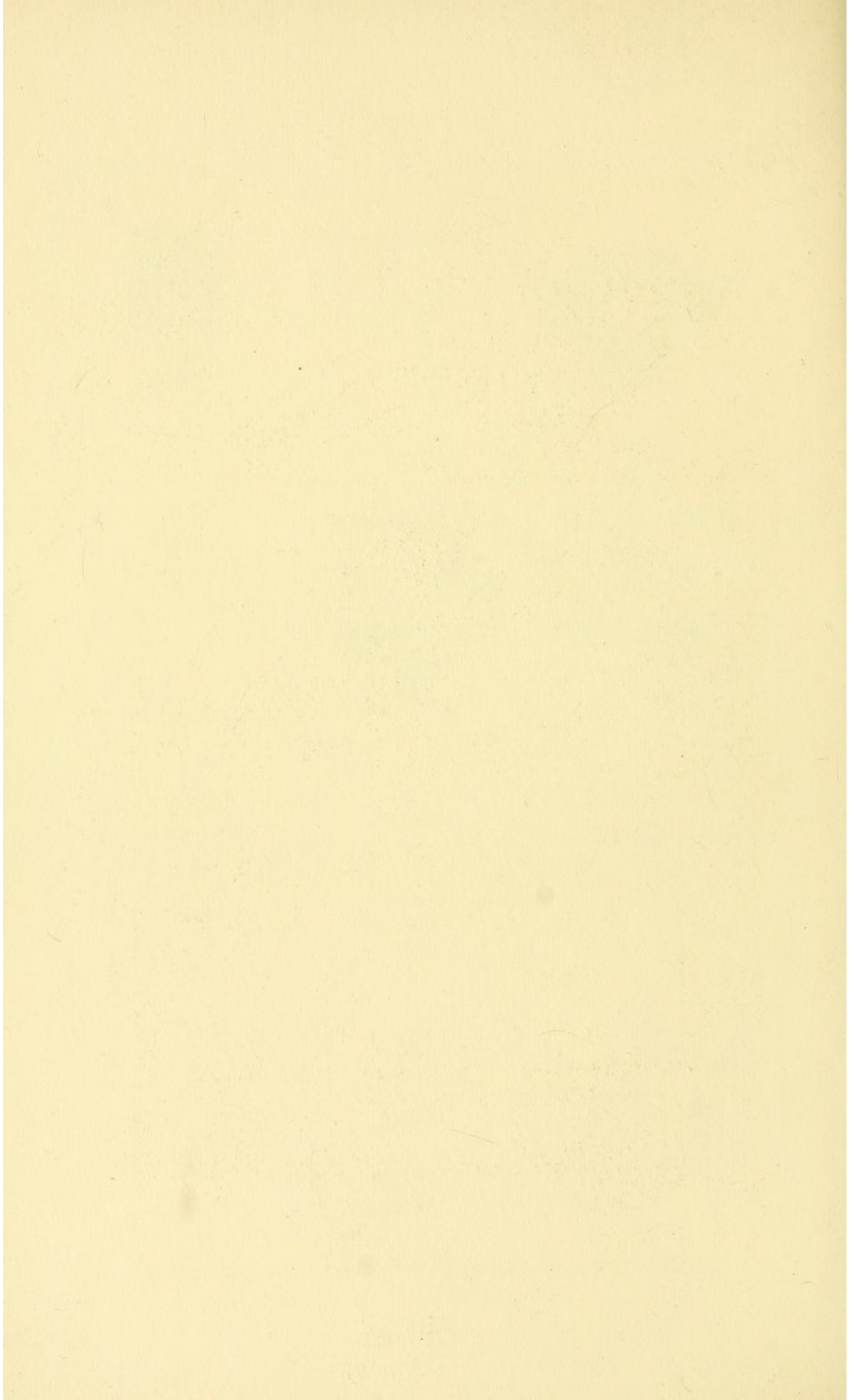


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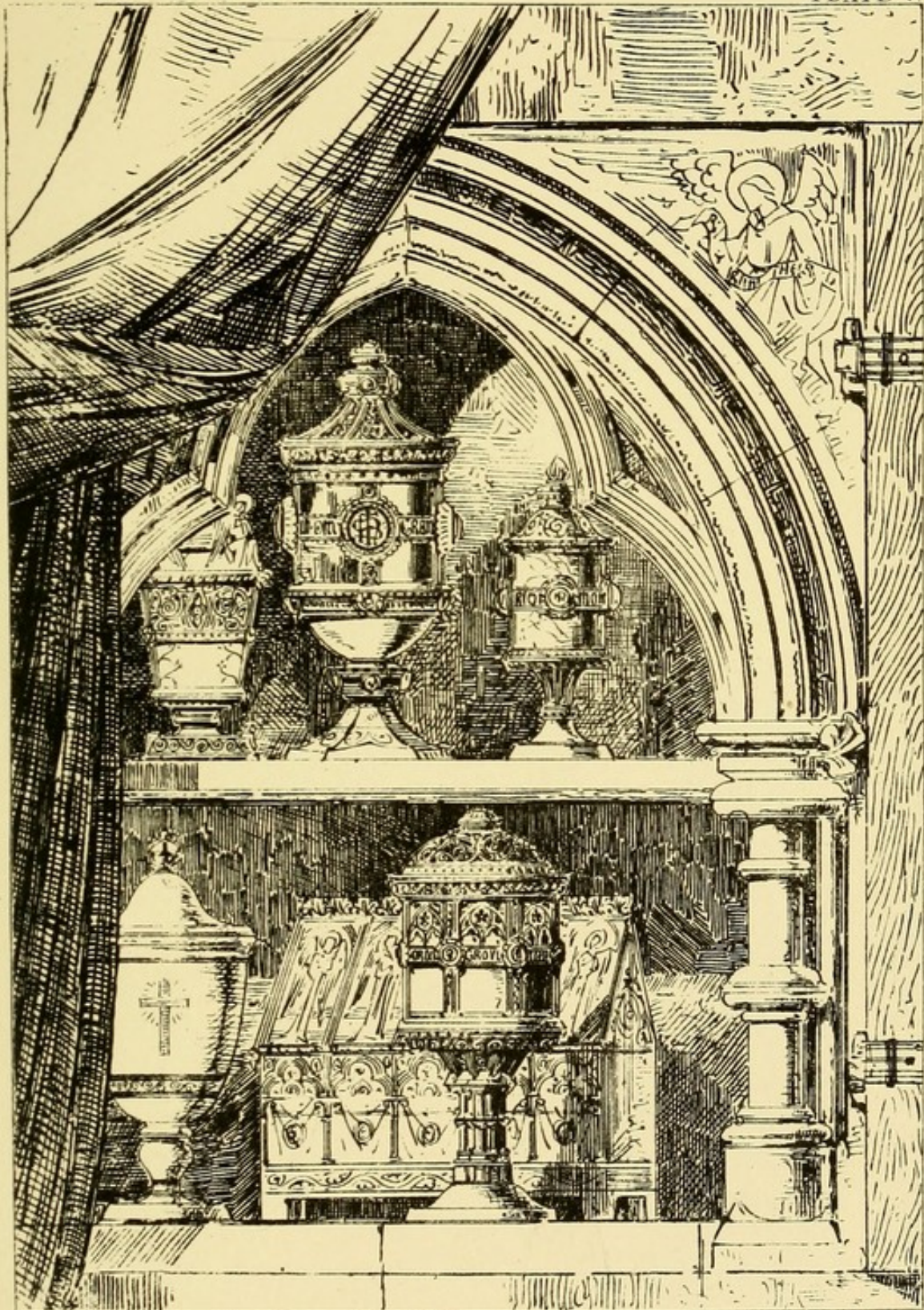
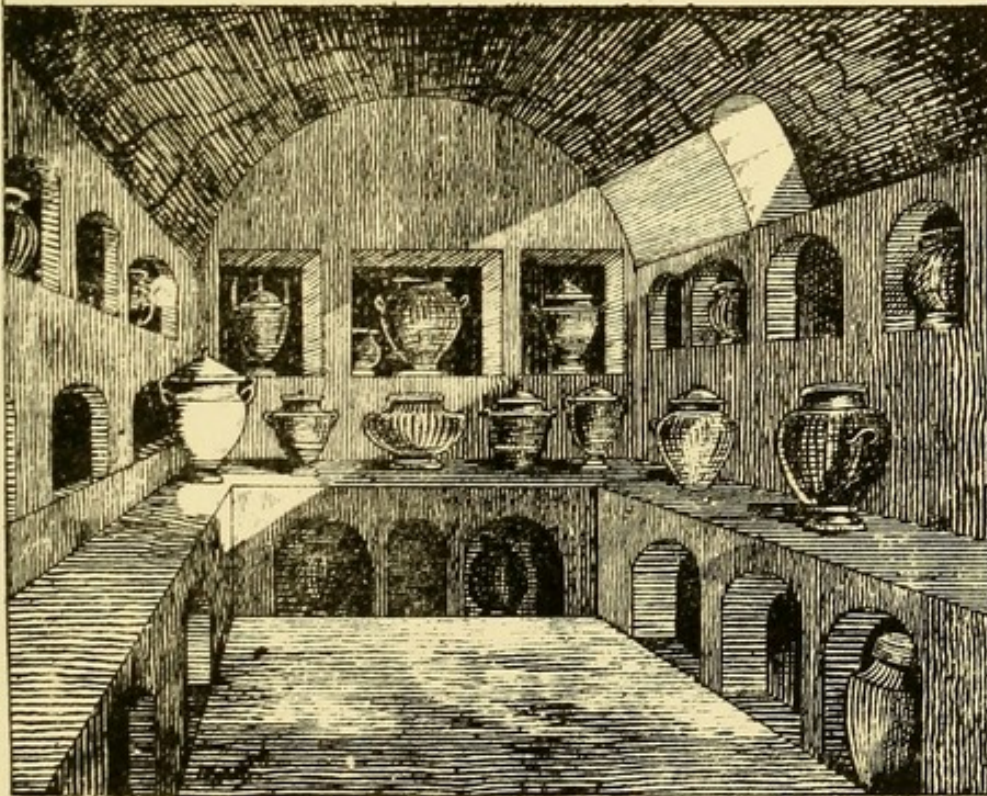
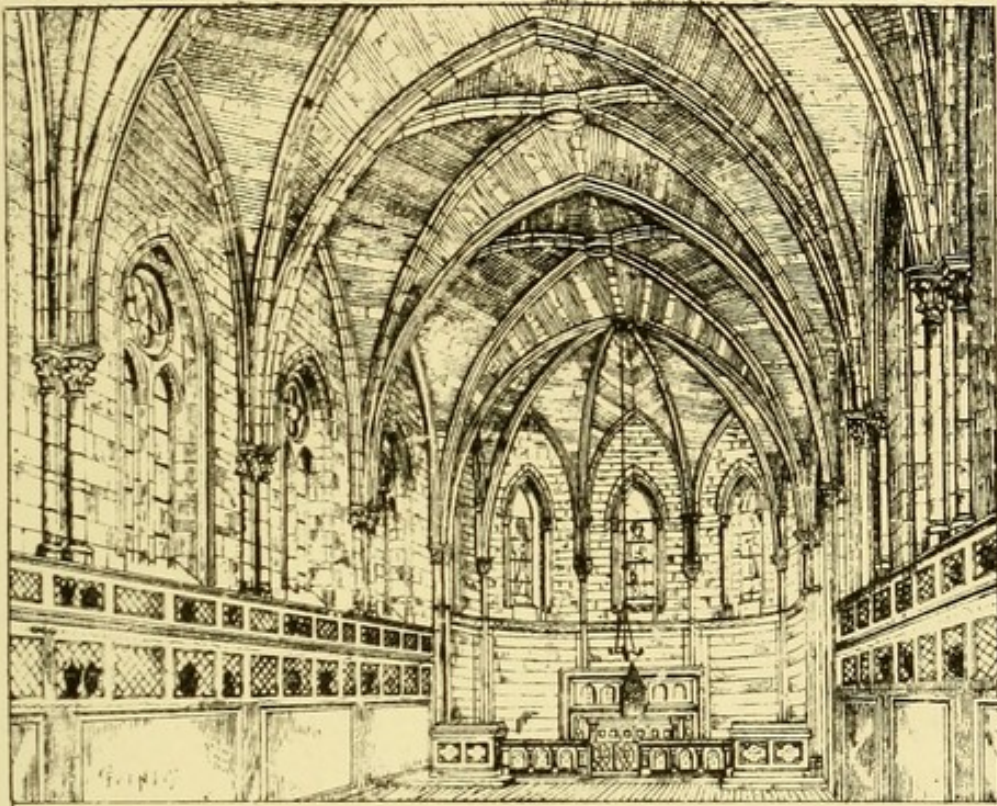


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SKETCH OF FAMILY COLUMBARIUM
OR NICHE IN PRIVATE CHAPEL



Plans furnished by Messrs. J. Cook & Partners, Architects, 11, Abchurch Lane, London, E.C. 4.

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URNS IN THE CHURCH AND CRYPT.

