

Resuscitation of the Drowned in Malta Historical Echoes from the Past

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Introduction

Death studies centering round the problem of apparent death - especially in the drowned - occupied a prominent place in the medical literature of the 18th century. This concern gave rise to the formation of humane societies aiming at saving the life of the drowned and of asphyxiated persons who could be mistaken for dead. The first such society was founded in 1767 in Amsterdam where many persons were drowned each year in the canals. It was followed by other societies in subsequent years - Venice (1768), Paris (1771), London (1774) and Philadelphia (1780)⁽¹⁾.

Procedures for the reanimation of the drowned were described and applied in Italy from the 17th century onwards as by that time it was realised that the drowned, though showing no manifest signs of life, could have been only apparently dead⁽²⁾.

The European Experience

In England there was at least one book, dealing with the revival of the drowned, available at this period. This was Stephen Bradwell's *Helps for suddain (sic) accidents endangering life* published in 1633. Bradwell recommended "draining the water out of the body by holding up the feet" and "stroaking (sic) crushing and driving (the patient's) belly and stomache (sic) reasonably hard". The whole procedure was to be carried out in a warm room⁽³⁾.

Paolo Zacchia (1584-1659), who is considered to be the founder of Forensic Medicine in Italy, dealt with the subject of apparent death in the drowned in his *Questionum medico-legalium* (Lugduni, 1656). He drew attention to the fact that when actual death occurred it was due not to the ingestion of water, as was then believed, but to obstruction of respiration.⁽⁴⁾

In 1749, Lorenz Heister (1683-1758), in his *Institutiones chirurgicae* (Naples, 1749), recommended tracheotomy for the revival of the drowned. The operator was to insert a tube in the incision made in the trachea and to blow into it to inflate the lungs. If no tube was available, he was to place his mouth (*nudo ore*) directly over the tracheotomy incision

and breathe forcibly into it - an anticipation of the mouth-to-mouth method of resuscitation.⁽⁵⁾

Wilson warned in 1752 that in cases of drowning death may only be apparent and he describes tests to distinguish between real and apparent death.⁽⁶⁾

In 1753, Anton Louis (1723-92), in his treatise on the *Certitude des signes de la mort*, devoted a section to the types of assistance to be rendered to the drowned and discussed the "true cause of death" in such cases. He favoured the introduction of warm fumes of tobacco in the patient's intestines through the anus and carrying out venesection from the jugular vein "to relieve cerebral congestion"; however he looked askance at the performance of tracheotomy as this procedure could easily be replaced by ventilating the patient's lungs "by blowing inside his mouth while pinching his nose". In fact, in his view, among all forms of help priority must be given "to the blowing of warm air inside the lungs. I have never seen anything as efficacious as this measure".⁽⁷⁾

De Villiers' *Methode pour rappeler les noyes a la vie* (Modlins), published in 1771, dealt specifically with the means of "bringing the drowned back to life", as we shall describe in detail further on. (Fig.1)

In 1773 Giovanni Targioni Tozzetti devoted a substantial part of his book on the treatment of asphyxia to the means of reviving the apparently dead from drowning.⁽⁸⁾ Among the various means of restoring suspended animation proposed in his time, he gives priority to mouth-to-mouth "insufflation" and cites instances of revival, in support of the efficiency of this method, that occurred in 1732, 1748 and 1769. He advocated tracheotomy, with insertion of a cannula in the incision, only if mouth-to-mouth respiration failed, especially in cases where it was suspected that entry of air inside the lungs was obstructed by the plugging of the glottis with viscous material or with a foreign body.

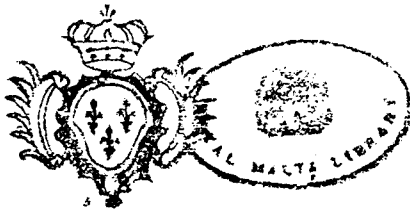
A Spanish pamphlet published by Carlos Galup

in 1776 considered the preventive side of the problem by proposing to the Spanish Government the establishment of a swimming school to teach people to swim and to train them how to make use of any floating objects to save their own life and that of others who found themselves in difficulties at sea.⁽⁹⁾

MÉTHODE
POUR
RAPPELER LES NOYÉS
A LA VIE,

Recueillie des meilleurs Auteurs.

PAR M. DE VILLIERS, Docteur en
Médecine, ancien Médecin des Ar-
mées du Roi de France en Allemagne,
& Médecin de la Faculté de Paris.



A MOULINS,

De l'Imprimerie de C. J. PAVY
Imprimeur ordinaire du Roi.

M. DCCCLXXI.

FIG. 1 Title-page of De Villiers' treatise on the resuscitation of the drowned. 1771. National Malta Library.

The Malta Experience

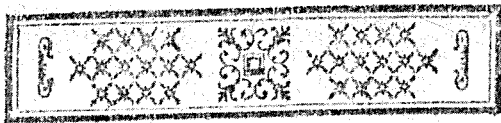
During the 17th and 18th centuries, when these studies were published, Malta was under the Order of St. John of Jerusalem which by that time had asserted itself as a maritime organisation engaged not only in warfare against the Moslems but also as a participant in the sea trade of the Mediterranean. It is, therefore, to be expected that among the many literary works held by our National Library, that was founded in the late 18th century, there would be a number of publications dealing

with nautical topics. In fact there are books on ship construction, navigation and on matters bearing on the health of crews and on the dangers to life to which mariners were exposed. This last category comprises a work on how to preserve the wholesomeness of food and drink on board ships⁽¹⁰⁾; a treatise on how to turn sea-water into drinking water⁽¹¹⁾; a book dealing with the means of ventilating the holds of ships⁽¹²⁾; and a monograph on the most common diseases among seamen⁽¹³⁾.

The National Library also holds the works, already mentioned, by Zacchia, Heister, Wilson, Louis, De Villiers, Targioni-Tozzetti and Galup. Though these books are not inscribed with the names of their owners, it is not unlikely that they originally formed part of the private libraries of the Knights of the Order of St. John who resided in Malta in the 17th and 18th centuries; or the library of the Conventual Church of St. John - all of which were added at different times to the stock of the National Library following its foundation in 1763. However that may be, the existence of these books in Malta three to two centuries ago is strong evidence of the awareness of drowning hazards and of interest in life-saving measures on the part of officialdom in our island. Familiarity with these works is also shown by the fact that Zacchia and Wilson were still being cited in the writings of prominent members of the Maltese medical profession as late as 1872⁽¹⁴⁾.

As De Villiers' study is the most comprehensive and instructive among the books referred to above, it calls for special and detailed attention. The physiological concepts on which De Villiers bases his work were still dominated by the humoral theory. It was held that in drowning the movements of the humours, which were conveyed to all parts of the body by the blood circulation, ceased owing to the arrest and congelation of the blood circulation due to the low temperature of the water. Thus life became extinct. The methods proposed by De Villiers were meant to counteract these phenomena by (a) re-establishing the "natural warmth" of the body; (b) restoring the blood circulation; (c) relieving the lungs and brain of their engorgement by stagnant blood; and (d) removing any water contained in the lungs.

The practical management advocated to achieve these ends was:- (a) introduction of the "warm smoke" of tobacco inside the intestines through the anus by means of a specially designed apparatus; if this instrument was not available, a lighted wooden tobacco pipe would serve the same purpose. Other tobacco medication consisted in inser-



THE S I S.

AN MORTIS INCERTÆ SIGNA-
minùs incerta à Chirurgicis, quam ab
aliis experimentis.

I.

MORS certa; mors incerta. Mo-
riendum esse, certum omnino; mor-
tuum esse incertum aliquando. E feratibus
involutis, è feretris, imò è tumulis evasisse
quam plures; decessisse creditos, compertum
est. Compertum itidem, precipitanter hu-
matos non nisi preposteram obiisse mortem,
morte eorum, quos funis ac rota necant,
multò magis horrendam. Compertum præ-
terea, præfestinata anatome traditos, non-
dum finite vite notas ipso plage funesta
momento dedisse manifestissimas; pudore
feruatoris incauti maximo, maximâque sa-
mille superstitiis indignatione comitatas. Fa-
bulatur, ais, qui talia narrant. DUN S
SCOTUM in tumulo momordisse brachia;
idemque ZENON Imperator, post ite-
ratos, èr ab exanthematis audire eulatus
occidisse; nugæ opinari. Traxerunt hæc,
licebit. Non licet itidem testes repudiare



T H E S E.

LES EPREUVES CHIRURGIQUES
donnent-elles des signes plus certains d'une
mort douteuse, que les autres expériences.

I.

RIEN de si certain que la mort, puis-
qu'elle est inévitable; rien de si in-
certain, puisque des personnes réputées
mortes, & qu'on avoit ensevelies, sont
forties de leur cercueil & même de leur
tombeau. Combien des gens y sont morts,
pour avoir été enterrés avec trop de préci-
pitation; fort bien plus affreux sans doute,
que celui des misérables livrés aux derniers
supplices. Il y a des exemples de person-
nes qui ont donné des marques certaines
de vie, à l'instant qu'un Anatomiste im-
prudent, portant sur elles un fer meurtrier,
se couvroit de honte, & excitoit l'indi-
gnation de toute une famille. Direz-vous
que tout cela est fabuleux? Croyez-vous
qu'il soit faux que Scot se soit rongé les
bras dans son tombeau, & que l'Empereur
ZENON; en ait fait autant, après plusieurs
gémissemens que les Gardes ont entendus.

A ij

FIG. 2 Latin and French texts of Wilson's Thesis
on the differential diagnosis between ap-
parent and real death. 1752. National
Malta Library.

ting suppositories of "Brazil tobacco"; blowing tobacco smoke into the nose and mouth; and placing tobacco powder inside the nostrils to stimulate sneezing; (b) removal of wet clothing and drying the skin; rubbing the body with warm pieces of lannel or linen soaked in brandy; covering it with warm wood-ashes or cow-dung or with the skins of recently killed animals; and even inducing "healthy persons" to lie in the same bed as the patient; (c) venesection from the jugular vein as soon as possible to relieve the brain and lungs of stagnant blood

and thus re-establish the circulation of the blood and humours; (d) mouth-to-mouth "forceful" breathing by the rescuer, after closing the nostrils of the patient, to inflate the latter's lungs. Great emphasis was made on this "successful" method of direct mouth contact which, states De Villiers, if practiced early enough "could be most effective and even surpass in results the introduction of tobacco fumes in the intestines".

Persistence for some hours in applying these measures was essential, remarks De Villiers, for

drowned persons had been revived even after four to five hours of such treatments. He also cites a case that was brought to life in 1676 after being submerged for sixteen hours.

De Villiers warned against the adoption of certain "barbaric and deadly" measures such as rolling the patient over a cask; suspending him head downwards from his feet; keeping him face upwards (instead of placing him on his side and changing this position from time to time or on to his stomach); and pouring warm liquids and urine down his mouth.

Evidence of unmistakably Maltese interest in the reanimation of the drowned is provided by the insertion in the *Malta Government Gazette* of the 8th August 1827 (p.27) - then the only newspaper in the island - of a short annotation on the "Method of Restoring Life to the Apparently Drowned" that had been circulated in London in 1823. The text run thus:- "Avoid all rough usage. Do not hold up the body by the feet or roll it on casks or rub it with salt or spirit or apply tobacco. Lose not a moment.

Carry the body, the head and shoulders raised, to the nearest house. Place it in a warm room. Let it be instantly stripped, dried and wrapped in hot blanket... Attempt to restore breathing by gently blowing with bellows into one nostril, closing the mouth and the other nostril... Press down the breast carefully with both hands and then allow it to rise again and thus imitate natural breathing... Persevere for six hours. Send quickly for medical assistance".

A book on the management of the apparently dead by the Italian Pietro Manni, published in 1833, was available at the National Library. The author recommended the same methods of resuscitation as those advocated by De Villiers with the addition of two other measures - (a) the application of a cataplasm made of freshly burnt bread soaked in brandy over the cardiac region and another one over the external genital organs; and (b) stimulating the heart beat by shocks of galvanic electricity from a Leyden Jar and supplementing this with acupuncture.

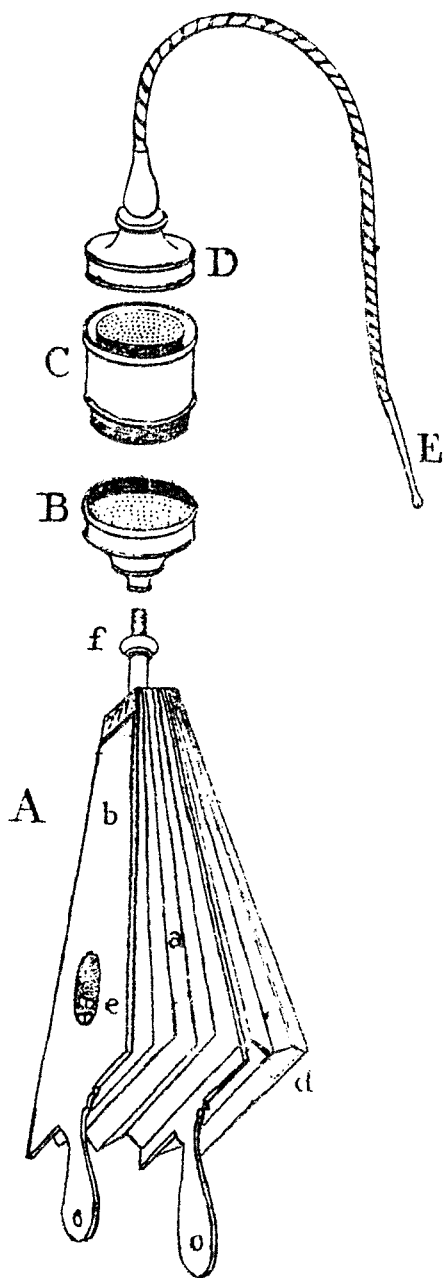


FIG. 3 Instrument for introducing tobacco smoke into the intestines. Container (C) with filter (B) for placing the lighted tobacco leaves. The movement of air created by the bellows (A) provokes the combustion of the tobacco leaves. Their smoke is pushed inside the tube (E) and

Manni still believed in the efficiency of the introduction of tobacco smoke in the intestines because of its "stimulant action" on the intestines since "these parts are always the last to lose vitality...when the heart has ceased to beat"⁽¹⁶⁾. However, he stressed the extreme importance of mouth-to-mouth respiration. Commenting on the origins of this form of artificial breathing, he states: "Since a long time intelligence and tenderness inspired desperate mothers to breathe in the mouths of their infants in tragic cases of asphyxia. And it is certain that the introduction of air in asphyxiated persons originated naturally by the mouth-to-mouth" method.

To overcome the aversion that may be felt by a rescuer to place his mouth over that of the drowned person, Manni recommends breathing through a tube placed in the person's mouth. Mouth-to-mouth breathing, he insists, is not only very efficacious but is always available as it needs no equipment, is easy to apply, does not involve loss of time and is harmless⁽¹⁷⁾.

Enough has been said to show that since at least in the 17th century there existed in Malta a cultural reservoir of information and a breadth of knowledge about the resuscitation of the drowned as represented by the holdings at our National Library. This information was obtainable in French, Spanish, Latin, Italian and, later on, in English - languages that were familiar to professional and literate people. There are hints, however, that reanimation measures were not carried out in all instances.

On touching the apparently dead.

One of the obstacles, remarked upon by De Villiers, that hindered the application of immediate life-saving measures abroad was the legal prohibition not to touch the body of a drowned person, that gave no signs of life, until the inquiring magistrate came on the scene. The motive behind this judicial order was the preservation of evidence that would enable the magistrate to determine whether the drowning was accidental or criminal and whether the person was hurled into the water while still alive or after being killed. In his comments on this injunction, De Villiers argues that the "formalities of justice" are to be "subordinated to the conservation of the species" and that the requirements of

the law can be reconciled with the principle of tendering the immediate "assistance due to humanity". In fact he describes how a Life Saving Society for the Drowned, set up in Amsterdam, had been instrumental in bringing about a change in the judicial attitude to the extent that magistrates in many towns in Holland authorised surgeons to administer all the means capable of restoring the drowned to life.

Similar legal difficulties appear to have been operative in Malta as well even up to the mid-19th century. In early August 1853 two young men were drowned in the Quarantine Harbour at Marsamxett. Their bodies were got out of the water within a quarter of an hour from the event and a doctor was sent for. He arrived an hour later but made no attempt to "restore suspended animation". A magisterial enquiry took place the following morning and a certificate of accidental death was issued. The *Malta Mail* considered the non-application of restorative measures as one of "culpable negligence". It would appear, commented the newspaper, "that any one dying suddenly cannot be removed until visited by competent authority - magisterial or medical". That this was the accepted notion was demonstrated by the fact that when a bystander offered to give assistance he was told that the bodies were in the hands of the police and could not be touched; so much so that no "attempt was made to restore them to life on the arrival of the medical officer" that had been called on the spot.

It is likely that this attitude stemmed from a too strict interpretation of a legal injunction of 1724 which laid down that following a murder or violent death "the cadavers are not to be touched (and moved) from their position and place... neither are they to be buried before the arrival of the Court (officials)... The constables are to bring this injunction to the notice of all persons concerned"⁽¹⁸⁾. The aim behind this legal measure was to ensure adequate scrutiny over incidents where foul play could have been involved. Moreover, in the case of dead bodies recovered from the sea, there was the added possibility that the cadavers may have been thrown overboard by passing ships following death from plague or cholera; hence the precaution not to touch these corpses lest the "contagion" be conveyed to those who handle them on shore⁽¹⁹⁾.

In its criticism of how the particular case of August 1853 was tackled, the *Malta Mail* referred to instances where restoration to life was established even after thirty-three minutes immersion and

stressed the need for persevering with resuscitation efforts for more than four hours. It made an appeal to government to revoke any laws that prohibited attempts to restore life and published the directions by the Royal Humane Society of England for the recovery of the apparently dead from drowning⁽²⁰⁾. Support for the *Malta Mail* came from the *Malta Times* which also printed the instructions of the Royal Humane Society and suggested their translation in Italian and Maltese and their distribution to all Police Stations near the sea shores of the Maltese Islands and to "other places of utility"⁽²¹⁾.

Methods of Resuscitation.

It is not known whether these suggestions were acted upon but there is evidence that government was concerned about the problem and that practical steps were envisaged to provide facilities for the revival of the drowned. In fact a few days before the accident of early August 1853, the Port Department had issued a public notice that "a resuscitating apparatus is at all times in readiness for use on application being made either at the Public Dispensary in Valletta, 17 *Strada Mercanti* or at that of Senglea No. 44 *Strada San Giuliano*. When accidents have occurred in which the apparatus might be useful... notice should be immediately given at the nearest of the Dispensaries above mentioned"⁽²²⁾.

By June 1855, at the instance of the Inspector of Charitable Institutions and by order of His Excellency the British Governor of the time, Police Stations along the littoral of Malta were furnished with "respiratory machines for the drowned". These machines were constructed in Malta by the "artist Giovanni Satariano" and modelled on a similar apparatus in use in England⁽²³⁾. No description has been found of the equipment and no information about G. Satariano has so far come to light. By the end of the century suspended animation apparatus was obtainable from the J.A. Montague of London. It consisted of an "improved stomach pump with elastic tube, two nasal pipes, bellows and bottle, all in mahogany case" as advertised in the *Surgical Instruments Catalogue* published in London in 1895.

Instructions of how to perform artificial respiration were given to nurses at the Central Hospital, Floriana, in 1904. They were taught how to revive unconscious persons with cessation of breathing following drowning accidents, gas poisoning and chloroform anaesthesia⁽²⁴⁾.

In 1909 the local Italian newspaper *Malta* published a series of three articles, in a popular vein, on how to render first aid in various types of accidents. The anonymous writer - very likely a medical practitioner - advocated Silvester's method to revive the drowned⁽²⁵⁾. In the same year Schafer's method was being taught to classes of First Aid of the St. John Ambulance Association by Dr. A. V. Bernard (later Chief Government Medical Officer). This method was applied on the 26th July 1909 by a member of the Association in an attempt to revive three men who were overcome by "foul gas" while working in a drain shaft in St. Mark Street, Valletta⁽²⁶⁾ and again on the 9th August of the same year when another two men were similarly asphyxiated⁽²⁷⁾. In July 1910 the Association was offering to give practical demonstrations on how to apply Schafer's method to any one desirous to learn it⁽²⁸⁾.

Detailed instructions for the application of Schafer's method, as recommended by the Royal Life Saving Society of the United Kingdom were published by *The Malta Herald* on the 11th July 1910. This paper also appealed to the Collector of Customs to obtain copies of the instructions with their accompanying charts and stressed the advantages of Schafer's method, i.e. the requirement of laying the patient face downwards, its safety, simplicity of operation, efficiency and the involvement of a minimum amount of effort on the part of the operator.

Silvester's and Schafer's remained the only two procedures of artificial respiration described in the 39th edition of *First Aid to the Injured* booklet published by the St. John Association in 1928⁽²⁹⁾.

However, the latest edition of the authorised *First Aid Manual*, issued jointly by the St. John Ambulance, St. Andrew's Ambulance Association and the British Red Cross Society in 1982 and used in Malta today, gives pride of place to Mouth-to-Mouth Ventilation as "the preferred method" and as "the most efficient way" of performing artificial respiration. The manual technique of Holger Nielsen and that of Silvester are recommended when Mouth-to-Mouth Ventilation cannot be used⁽³⁰⁾.

With emphasis on Mouth-to-Mouth Ventilation the wheel has turned full circle - to where we were over two hundred and fifty years ago, if not to a considerably earlier point in time i.e. to the primal days of humankind if we accept Manni's thesis that maternal "intelligence and tenderness" first inspired a desperate mother to breathe into the mouth of an asphyxiated infant to restore him to life.

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