an instinctive but violent desire to die; so strong, indeed, is it, that no will-power seems capable of overcoming it. The previous anxiety is lost when all preparations are made and the desired end appears near, and this sudden change to cheerfulness may give friends and attendants the cue to watch for the attempt.

As a rule, determined and deliberate attempts at suicide, with details carefully planned, indicate an unsound mind. When the attempt has failed to cause death, it is often found that insanity soon appears. In other cases the attempt itself relieves the condition which caused it, and death is no longer desired.

The flow of blood from a razor wound, Hammond says, may relieve the cerebral congestion present. In the same way, a plunge into the cold water may result in bringing the would-be suicide to a realizing sense of his desire for life rather than for death.

Others, to assure success, may tie their own hands and feet together before making the plunge, and may even attach weights to themselves, as in the recent case of a young actor who, before plunging into the Charles River, in Boston, put on a heavy coat of mail; and of a man who jumped from a Brooklyn ferryboat with lead-pipe wound round and round the body. The possible occurrence of such cases must be remembered in medico-legal and coroner's investigations, and not be mistaken for cases of murder. Financial ruin, famine, and pestilence following in the train of wars, etc., have often resulted in great numbers of suicides, the nervous system being over-excited.

Disease, as an inciting cause of the suicidal act, is not uncommon. The body, worn out with suffering, at last affects the mind, or the patient, believing his disease incurable, prefers to make an end of all his woes, and "fly to others which we know not of."

Statistics for Italy and France show that those affected with pellagra furnish a large percentage of suicides. Other diseases in which suicide appears to be common are those of the digestive organs, liver, etc., cancer, urinary diseases, phthisis, loss of sight, and chronic affections generally; after castration it appears also to be frequent. Suicides through physical suffering attain their maximum in the educated and cultivated classes.

Financial troubles cause the highest percentage among the working classes, though self-destruction is often seen after reverses of fortune, losses in gambling, and financial embarrassment in the wealthy.

Alcohol is a potent cause of self-inflicted death; drunkenness, poverty, and laziness going hand in hand. In the three years 1888–90, in Massachusetts, 93 suicides out of a total of 485, or 19 per cent., were due to intemperance.[18]

Passions.—Love, betrayed or disappointed, and jealousy are found to be a fruitful cause of suicide among students, soldiers, schoolmistresses, and servants. Explosions of rage and anger are apt to gradually increase and overcome the will-power to resist, until trivial circumstances will occasion violent outbursts, and may lead to violent acts against one's self. Hate, pride, shame, and revenge may all lead to suicide.

Other determining causes often found are domestic troubles, remorse, dishonor (as in women pregnant out of marriage), poverty, misfortune, grief, pain, and disappointment.

Occasionally regret is experienced before the act has been fully accomplished.

Method.—The method of securing death, and the place or scene of its execution, are influenced by the surroundings of the individual and the natural facilities afforded; but the supposition advanced by Esquirol, that the occupation governed the choice of instrument, is not always borne out by statistics. Still, it is found that the choice of the soldier falls, as if in theory it naturally would, upon firearms. Butchers, barbers, and shoemakers resort mostly to the knife. The favorite method varies in different countries, and although in a given locality or city the prevailing custom may change from time to time, there is a pretty constant preference for one fixed form from year to year. De Guerry[19] was the first to show a regularity in the method employed.

The rope appears to be the most common choice, second comes the water, firearms third, cutting instruments fourth, then follow jumping from a height, taking of poisons, inhalation of deadly fumes, etc.

There are two factors which, as a rule, influence the choice of the means, viz., certainty and quickness of action. Women are not so apt as men to make choice of a painless method.

There is also a difference in the means employed by women from those resorted to by men. In Italy, for example, the men shoot themselves, and women resort to the water when weary of life; while in Prussia over half the suicides die by hanging, and women surpass the men in their tendency to kill themselves by the knife.

Out of 2,896 suicides which occurred in England in 1900, 102 were upon railways, 690 were by gunshot wounds, throat-cutting, etc.; 10 by burns and explosions, 454 by poisons, 695 by drowning, 792 by hanging, 68 by jumping from a height, and 84 by other methods.

The poisons preferred were in the following order: Carbolic acid, 134; preparations of opium, 69; oxalic acid, 47; hydrochloric acid, 42; prussic acid, 36; strychnine, 17; cyanide of potassium, 16; phosphorus, 8.[3]

In Massachusetts suicides by the use of arsenic had increased from 2 in 1878 to 35 in 1887, but had again fallen off to 9 in 1899 and 6 in 1900.[18]

Poison, as a choice, appears to be increasing in favor in this country, and to be on the decline in France; in fact, the favor it receives among Anglo-Saxon suicides is shown to reach 40.8 per cent., including this country. Out of 148 cases of suicide occurring in New York in the year 1876, poison was used in 31.7 per cent., firearms in 33.1; hanging gave 13.5; cutting wounds, 10.8; drowning, 6.8; falls from height, 3.4; and other means, 0.7; thus showing that poison and firearms were the choice, each in about one-third of the cases. This predilection on the part of the English and Irish for poisons is further shown by the following table, taken from Morselli, and giving the suicides among foreigners in New York for the year 1876:

Per 100.	English.	French.	Germans.	Irish.
Poisoning	46.1	25.0	28.9	52.4
Hanging	....	12.5	17.4	4.8
Asphyxia and drowning	....	....	5.7	9.6
Gunshot wounds	15.4	50.0	35.0	4.8
Cutting and stabbing	30.8	....	7.2	9.5
Falls from height	7.7	12.5	5.8	18.9
Total	100.0	100.0	100.0	100.0

The following were the methods employed by suicides in Paris for the five years 1895–99:[24]

Poison	192	Cutting instruments	69
Asphyxia	1,075	Jumping from a height	265
Strangulation (hanging)	1,310	Crushing, railroad	19
Drowning	988	Other modes	4
Firearms	747		

The following figures show the methods adopted in the United States in 1900 (United States Census):

	Males.	Females.
Shooting	1,190	103
Drowning	157	84
Poison	761	464
Other methods	2,205	534
Total	4,313	1,185

The methods employed at different ages present striking differences, according to the United States Census of 1900, where it appears that at ages 15–24, 168 females and only 95 males committed suicide by poison, while at

ages 50–59, 184 males suicided by shooting, and only 7 females.[13]

Drowning as a means decreases as the north is approached; the colder the water, the fewer its attractions.

Devergie found that in Paris, from 1827 to 1836, drowning, together with asphyxia by charcoal fumes, held the second place, but in 1851 Trébuchet placed asphyxia at the head of the list. This latter mode of death has spread rapidly over Europe and increased in fashion in Paris. The reasons for this are that it affords the most painless and agreeable form of death, and, strange as it may appear, man's vanity extends beyond the gates of death, and the suicide desires the body to present a good appearance after the breath has left it, and knows that there is usually no disfigurement from charcoal fumes.

The introduction of a new and easy method of committing suicide affects the numbers by different methods. Previous to 1890 the extremely poisonous agent, water gas, was excluded from Massachusetts by law. After the repeal of this law in 1890, its use became free and unrestricted, and the suicides by gas poisoning increased from a total of 5 out of 915 by all methods in the five years 1886–90, or 0.55 per cent., to a total of 116 out of 1,575 by all methods, or 7.4 per cent., in the five years 1896–1900, an increase of nearly fifteenfold.[18]

Only the other day the papers contained an account of a "wholesale charcoaling," in which a father, mother, and two children sought death in this way, preferring this mode of death to starvation. When heredity is a factor in the case, the method of exit from the world is apt to be the same as that employed by the ancestor.

Winslow says that one manner of death having been conceived, the man bent on suicide will wait a long time until he can carry out his particular plans. We, however, often see a man who has failed in one way take the first opportunity to secure death in another. Maniacs are most apt to throw themselves from a height, and it is often difficult to say whether one who has fallen from a window did so in simply making an attempt to escape imaginary enemies, mistaking the window for a door, or possibly walked out without any knowledge of the act, or was conscious of the attempt. Some inflict wounds upon themselves, or severely injure the head by pounding it against the wall, impelled by their pains to seek this means of gaining relief. Melancholics often hear a voice urging them to take their lives, and this "voice" at times suggests the means.

Place.—Much ceremony attends the act in some individuals, and publicity is sought. This is often done when revenge is intended. Usually, however, suicides occur in privacy, and it is not uncommon for a man to retire to a concealed and unfrequented spot to carry out his object.

Particular places may become, as it were, fashionable for a time in the suicidal world. Thus, one year, in Paris, the Arc de Triomphe, another Nôtre Dame steeple, and another one of the bridges, will be the favorite leap. The Milan Cathedral, St. Peter's at Rome, and the Campanile at Florence have all in turn had their epidemics, so to speak. So also have the Brooklyn Bridge and Niagara Falls in America.

Esquirol[20] relates a very remarkable method which was employed in a case reported by Dr. Ruggieri,[21] an Italian, which shows what an amount of self-inflicted torture will be endured. A shoemaker in Naples, who had the year before castrated himself and thrown the genitals from the window, after making a good recovery, conceived the idea that God had commanded him to suffer on the cross. He passed two years in perfecting his plans, which were so well carried out that one morning he was found with hands and feet securely nailed to a cross, with a stab wound in the left side, hanging out of his bedroom window. He had constructed the cross and attached it by ropes in such a way that after crucifying himself he could, by motions of the body, cause it to slip from the window. When rescued he was delirious, and although he recovered from his wounds, he exhausted himself by fasting and died.

A novel method has just been introduced in this country, by an anarchist, of exploding a dynamite cartridge in the mouth, bearing out Esquirol's claim that the instrument chosen was apt to be the one which the suicide used professionally.

Time.—The time of day most favorable to acts of self-destruction appears to be between the hours of six and twelve in the morning. This preference for the early part of the day extends to the other divisions of time, for it has been found that more suicides occur in the forepart of the week and the first half of the month than in the latter parts.

Symptoms.—It is questionable whether we can say that there are any actual symptoms by which an act of suicide can be predicted. In insanity, and especially in melancholia, an attempt must always be watched for.

In some cases a man, who has been previously healthy, will complain of pain in the epigastrium, of heaviness in the head, will become quiet, listless, lose all ambition, refuse to work or attend to his usual vocations; the habits are changed, and intoxication may be indulged in. There may be scarcely any other symptoms until he tries to cut the thread of life. Weariness of life is often complained of, but Esquirol says he has never seen any attempt because of this *tædium vitæ* alone.

Some individuals predict that they will some day kill themselves and eventually do, but as a rule the one who threatens the act rarely commits it.

In some cases it may be discovered that preparations are being made for death, associated with a sadness of expression and an uneasiness of action. In melancholia the opposite condition may prevail just before the attempt, when all the plans are laid. The skin of suicides has been said to assume a yellow tinge and the features to become shrivelled, giving a changed appearance at the same time that a change is noticed in the actions.

Anæsthesia is a marked symptom at the actual moment of the attempt in many cases, and it is said that after the skin is cut the pain in cutting the throat is not at all severe. This accounts for the little complaint or appearance of pain in cases which, it would appear, must have been attended with torture.

Diagnosis is important in a medico-legal sense, as we have seen that few signs or symptoms of value precede the act. A knowledge of previous attempts will aid us, and at times a hint may be given by some word of the individual or by an ante-mortem letter.

If the attempt has failed the fact may be acknowledged; if death has resulted, writings are to be looked for. The body is to be examined for lesions, especially in the vital regions. The direction of bullet and penetrating stab wounds is to be carefully noted, and the existence or absence of powder marks upon the skin, and wadding, pieces of clothing, etc., within the wound. If death has resulted from a sharp weapon, signs of violence must be looked for upon the body and in its surroundings. The employment of a razor, although favoring a theory of suicide, is not to be regarded as conclusive, because in this country it is quite a favorite weapon with the negro race. If the razor can be shown to belong to the individual, the suicide theory is strengthened.

If poison has been taken, a bottle or paper which has contained it may be discovered near the scene. Though most men found hanging are suicides, the possibilities of lynching and of hanging a dead body to hide a crime must be remembered. In the case of bodies found in the water, great care must be exercised in giving true significance to wounds, and determining whether they were inflicted before death. The fact that the limbs are tied has not great weight, for the suicide might have thought thus to assure success, and even have attached weights to the body.

Pathological lesions found on autopsy shed but little light on the subject of suicide.

Prophylaxis.—Cannot something be done, we instinctively ask, to prevent so great a number of human beings

from committing so heinous an act? Something at least to prevent the ever-constant increase? The solution of the problem must lie largely in the better care of the insane, and earlier and more scientific treatment of mental diseases. Hospitals properly equipped for the treatment, supervision, and restraint of the mentally weak and infirm, and the disappearance of the popular prejudice against insane asylums, will do much to decrease the number of suicides in this large class.

Legislation.—In epidemic suicide and in alarming increase of the act, it has been found necessary to enforce stringent laws against the bodies, property, and families of the suicide at various periods of the world's history, and at times with some apparent success.

Laws were established in regard to suicide at a very early day. Zeno's motto, which was such a favorite phrase of the Stoics, "*Mori licet cui vivere non placet,*" was found not to have an application to the individual whose act caused injury to others and loss to the state. It was opposed to the teaching of the Bible, which says, "Thou shalt not kill."

Esquirol thinks some threatening law against the individual should be enforced with reference to the social usages of the people of each particular country. He says comminatory laws have caused suicide to cease in Egypt and Miletus.

Legislation, though not powerful to accomplish much, should nevertheless exist. It will undoubtedly deter a few, and this alone will prove its usefulness.

The attempt at suicide is punishable in New York State by five years' imprisonment, according to existing laws recently enacted.

The confiscation of property and denial of the right of burial, formerly practised in France, have of late years been stricken from the Code.

Formerly, in England, the body of a suicide was treated with ignominy, buried in the highway, and transfixed by a stake. When this law was abolished, the body could still only be buried at night and without religious rites. The canons of the Roman Catholic Church still forbid the burial of a suicide in consecrated ground.

The laws of antiquity, severe as they were upon the family, name, and possessions of the individual, had but slight effect in repressing suicide, as would naturally be expected in the case of the insane, who contribute most largely. In some countries the bodies of all suicides are given for dissection.

The public press has it in its power to favor an increase in suicide by publishing, with minute details, descriptions of all suicides, thus exciting depraved tastes, pampering to the vicious, and putting ideas regarding the act into the minds of nervously weak and predisposed persons. Fortunately, this tendency is much less marked than at a former period, but the danger should be constantly pointed out and guarded against when suicides become at all frequent in a community.

Silence is the antidote for this form of nervous, imitative suicide, as Moreau has aptly and truly said.

TREATMENT.—When a tendency to self-destruction has been discovered, moral treatment may be of much benefit. Kindness, cheerful attention, and society, and the assurance of aid and support, may brighten hope. Argument and sympathy have never done good. When an individual threatens to kill himself, the best treatment is probably to tell him to go ahead and do it. This usually results in a cessation of the threats.

Those mentally afflicted should be placed in institutions, and it has been recommended that all having suicidal tendency be placed together, at least at night, and this plan is carried out in many of our institutions. Tonics and sedatives are usually called for, and remedies suited to the physical derangement, whatever that may be.

Charles W. Allen.

Revised by *Samuel W. Abbott.*

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SULFOSOT is a syrup containing about five per cent. each of guaiacol and cresol sulfonates of potassium. These are obtained by treating creosote with concentrated sulphuric acid and combining with potassium. The remedy is used for tuberculosis in dose of 4 c.c. (℥i.).

W. A. Bastedo.

SULPHAMINOL.—An antiseptic formed by the action of sulphur upon certain salts of the aromatic series. In the body it is supposed to decompose into carbolic acid and sulphur compounds. It was introduced for the purpose of replacing iodoform, on account of its active antiseptic action and freedom from odor. It is a pale yellow powder, without taste or odor, insoluble in water but dissolved by the addition of alkalies; it is soluble in alcohol. When subjected to heat it turns brown and melts at about 155° C. The dose for internal administration is four grains three times a day, but it does not appear to have been used to any extent.

Externally, it has been used in all cases in which iodoform is employed.

Beaumont Small.

SULPHIDES.—Sulphides of four metallic bases occur among medicines, namely, sulphides of *mercury, antimony, potassium,* and *calcium.* Of these, the sulphides of mercury and antimony are, medicinally, not specifically peculiar, and will be found discussed under the titles of the several metals. The sulphides of the other two bases exhibit marked properties, evidently due to the sulphur of their composition, and accordingly form a distinct group of medicines. The common characteristics are, physically, an alkaline reaction, a disagreeable smell, and an alkaline and offensive sulphureted taste; physiologically, quite intense, irritant properties, and a special obnoxiousness to animal and vegetable skin parasites; and, therapeutically, a local healing influence over many skin diseases in their chronic stage, and, given internally, an uncertain tendency to abate chronic glandular, or cutaneous, or arthritic disease, and to control or repress suppuration. In full dose too long continued, the compounds tend to impair general nutrition, leading to emaciation and muscular weakness. Following are in detail the pharmaceutical preparations containing the sulphides in question, with their special properties and uses:

POTASSA SULPHURATA: *Sulphurated Potassa.*—This is an official preparation of the United States Pharmacopœia, made by heating in a covered crucible, to melting, a mixture of dried potassium carbonate and sublimed sulphur. The product solidifies upon cooling, and is then broken into pieces and put up in well-stoppered bottles of hard glass. Products obtained by the foregoing general process are commonly called, generically, *hepar sulphuris* (liver of sulphur), the name being expressive of the color. Such products are composite bodies, but the composition varies according to the degree of heat to which the mixture of potassium carbonate and sulphur has been subjected in the preparation. By the comparatively low heat directed in the United States pharmacopœial process, the product is probably a mixture of potassium hyposulphite and trisulphide ($K_2S_2O_3 + 2K_2S_3$). At a higher heat, such as is used in the British pharmacopœial process, the hyposulphite first formed splits into potassium sulphate and pentasulphide. When freshly made, sulphurated potassa appears in irregular, liver-colored lumps, which, on exposure to the air, gradually absorb oxygen, carbon dioxide, and water, and change color to a greenish-yellow. Finally they turn into a gray material containing potassium carbonate, sulphate, and hyposulphite. Liver of sulphur dissolves, all but a small residue, in two parts of cold water. Alcohol dissolves the potassium sulphide, but leaves undissolved the other component substances of the preparation. Sulphurated potassa should contain at least fifty-six per cent. of potassium sulphide. It is decomposed by mineral acids, and by most solutions of metallic salts.

Sulphurated potassa possesses the general properties detailed above; it is violently irritant, even to corrosiveness, and overdosage may easily kill by excessive gastro-intestinal irritation. The medicine is used, locally, to kill parasites, and to favor the healing of skin disease or the abatement of rheumatic or gouty troubles, and, internally, to assist in the two latter-named operations. The parasiticide action is utilized mainly for the destruction of the itch insect, for which purpose this compound is exceedingly efficacious. The preparation is applied locally, in the form of ointment, lotion, or general bath. For an ointment of proper average strength, sulphurated potassa may be mixed with lard in the proportion of six per cent. of the former; for a lotion, an aqueous solution ranging from three to six per cent. in strength may be used; and, for a bath, about 125 gm. (four ounces) may be dissolved in about 120 litres of water (about 30 gallons). Concentrated applications never should be made, because of the sharp irritation which would result. Baths containing sulphurated potassa (commonly spoken of as *sulphur baths*), besides their foregoing use, are sometimes employed in the treatment of chronic lead-poisoning, because of the finding that patients suffering from lead contamination show upon their skins, after immersion in a sulphur bath, a dark discoloration, as from the forming there of lead sulphide. The inference is that the sulphur in some mysterious way coaxes the lead out of the system through the skin emunctories, in order to satisfy its chemical longing for a union with the metal. Sulphur baths are administered warm or hot, and of a duration from half an hour to two or three hours. They are apt, particularly when protracted, to produce a good deal of irritation of the skin, even to the development of a papular or vesicular eruption. These baths should be prepared in wooden tubs. For internal giving, the dose of sulphurated potassa ranges from 0.12 to 0.40 gm. (two to six grains), several times a day, given in pill or in some aromatized syrup.

CALX SULPHURATA: *Sulphurated Lime.*—The preparation thus named in the United States Pharmacopœia is what is commonly, but incorrectly, called *sulphide of calcium.* It is a mixture in varying proportions of calcium sulphide, calcium sulphate, and carbon, but should contain at least sixty per cent. of calcium sulphide—the salt which gives the substance its medicinal activity. Sulphurated lime is made, by the process directed in the United States Pharmacopœia, by heating to a bright red heat in a closed crucible a mixure of dried calcium sulphate, charcoal, and starch. The product, after cooling, is pulverized, and at once put up in small glass-stoppered vials. It appears as a grayish-white or yellowish-white powder, which slowly decomposes on exposure to the air. It has a faint odor of hydrogen sulphide, and an offensive and alkaline taste. It is alkaline in reaction, is very slightly soluble in water, and insoluble in alcohol.

Sulphurated lime, like sulphurated potassa, has the general properties of the alkaline sulphides, as already detailed. It is powerfully irritant, even medicinal doses being apt to upset the stomach. And it is a disagreeable medicine for internal taking, also, because of its giving rise to eructations of sulphureted gases. The preparation has been used, locally, principally as a depilatory. For this purpose it is applied in powder, and, after fifteen minutes, the part is wiped with a wet sponge. Medicine and hairs then come away together. Internally, sulphurated lime has acquired a certain reputation as tending to control suppurations, the discharge lessening in quantity and offensive pus acquiring a better character under the medication. Given between times in recurring suppurations, as in recurring crops of boils, it is also held to abate the frequency and severity of the attacks. The dose of sulphurated lime ranges from 0.003 to 0.006 gm. (gr. $\frac{1}{20}$ to gr. $\frac{1}{10}$), several times a day, or even hourly, given most conveniently in trituration with sugar of milk.

Edward Curtis.

SULPHITES AND "HYPOSULPHITES" (Thiosulphates).—I. GENERAL MEDICINAL PROPERTIES OF SULPHITES AND "HYPOSULPHITES."—A number of sulphites and "hyposulphites" are used in medicine because of a virtue which they are considered to derive, in common, from their acid radicals, and accordingly such salts form a distinct group of medicines, which it is convenient to discuss under a single heading. The class characteristics are as follows: The salts are soluble in water, have a combined saline and sulphurous flavor, and are, in physiological operation, locally bland and constitutionally innocuous. From a medicinal point of view, their most important reaction is that in the presence of stronger acids they are decomposed, with the evolution of sulphurous acid. Given medicinally, they are thought to undergo this change in the stomach through the agency of the free acid of the gastric juice. The decomposition is said to be slower with "hyposulphites" than with sulphites. As a secondary result of the chemical change, sulphates are formed, such being the combination in which the base reappears in the urine when a sulphite or "hyposulphite" is swallowed in ordinary dosage. Medicinally, these salts are employed with the single view of obtaining by their means the germicide and antiseptic action of sulphurous acid. But in this connection it must carefully be borne in mind that sulphites and "hyposulphites," while maintaining their chemical composition as such, have been proved experimentally to be practically devoid of either germicide or antiseptic power.[1] They can, therefore, even theoretically, be of avail in this line only under circumstances determining their decomposition and the evolution thereby of sulphurous acid. Such reaction may take place in the stomach, but is seemingly impossible in the blood, and with the inference naturally following from these premises clinical experience is in accord. For these salts have been vaunted in the treatment of pyrosis and sarcinæ, and their employment has proved fairly efficacious; but they have been even more strenuously advocated for the treatment of constitutional diseases assumed to be caused by infection of living organisms (Polli), and have, in the