

society, on which the whole working is based:—

1. Associates to be of the Church of England (no such restriction being made as to members), and the organisation of the society to follow as much as possible that of the Church, being diocesan, parochial, and parochial.

2. Associates (working and honorary) and members to contribute annually to the funds, the former not less than 2s. 6d. a year, the latter not less than 6d. a year. Members' payments to go to the Central Fund.

3. No girl who has not borne a virtuous character to be admitted as a member; such character being lost, the member to forfeit her card.

The objects of the society are stated to be these:—

1. To bind together in one society ladies as associates and working girls and young women as members, for mutual help (religious and secular) for sympathy and prayer.

2. To encourage purity of life, dutifulness to parents, faithfulness to employers, and thrift.

3. To provide the privileges of the society for its members wherever they may be, by giving them an introduction from one branch to another.

Mutual help, mutual prayer, mutual love—in a word, to be friends to each other. Even a member in a lonely place, where there is no branch of the society within reach, does not lose the privilege of helping others; for her prayers and her subscription do more than she may often think for; but it is where many are gathered together in a branch that the chief work begins.

The associates and members of one town or district combine to form a branch, and it is desired to have a branch in every rural deanery, and one or more branches in every large town according to its requirements.

The branches, of which there are now about 640, can make their own rules, subject to certain limitations, arrange their own meetings, organize whatever they find most useful for their own members. For business girls, clubs or recreation rooms, where they may spend the evening, are a great boon; and evening classes of all kinds are often combined with these. In other cases members manage to afford each other help in sickness. Sometimes a country branch invites a member out of one of the great towns for a week or fortnight of country air. Such a change often prevents an illness and brightens a girl's life for many a day. Some undertake to send flowers to their sisters in the large towns. To young servants many branches offer small premiums for length of service with good character in one place. There is no end to the ways in which those whose hearts are warm can help one another.

Each branch is presided over by a branch secretary, chosen by the associates from among themselves. The branch secretaries of a diocese, with a few other ladies chosen by them, form a G. F. S. diocesan council, which elects a president for the diocese.

To the diocesan councils, which reach over a wider field than any single branch, belong more properly such works as the establishment of lodges for servants between their places or for girls looking for employment, homes of rest for the weary or ailing, or circulating libraries through which members may be supplied with plenty of pleasant and wholesome reading.

Finally, the presidents of the dioceses, with the addition of a few elected members, form the central council, to which are referred any questions affecting the whole society, and which elects the president of the council, who superintends the whole work. This post was held till this year by Mrs. Townsend, the

lady from whose wise and loving thought the whole scheme arose.

Some idea of the variety and magnitude of the work undertaken by the society can be gathered from the list of its nine different special departments, besides the general work in the branches. The first five of these have reference to the needs of girls in different employment. They are:—

1. G.F.S. Members in business.
2. G.F.S. Members in mills and factories.
3. Workhouse girls.
4. G.F.S. Members in service.
5. G.F.S. Registry.

The other four belong more to the society as a whole.

6. G.F.S. Lodges and lodgings.
7. G.F.S. Literature department.
8. Homes of rest for sick members.
9. Domestic economy and industrial training.

It will be seen that there is room here for everybody, and a variety of work for the associates to suit everyone's taste. Some, who cannot afford much time, undertake to spend an evening at regular intervals at one of the recreation rooms; and more volunteers for this work are especially wanted in the East End of London. Some can manage the looking after the box of books for their branch from the Girls' Friendly Society circulating library. Others, again, who have attended ambulance or cooking lectures, reproduce these in the evening for the benefit of the Girls' Friendly Society members who have not been able to attend themselves.

Each branch usually holds an annual festival, which is made an occasion for assembling as far as possible all the associates and members of the branch; and at almost all of these the central place is occupied by the service in church, for which a special form of service was sanctioned by Archbishop Tait.

The society has the sanction of the archbishops and bishops, and is under the patronage of Her Majesty the Queen. The Princess Christian has become an associate, and the Duchess of Connaught and the Duchess of Albany have become patronesses in the dioceses in which they reside.

If it is desired to form a new branch in any place, application should be made to the Diocesan President, whose name and address can always be learned from the Secretary, G.F.S. Central Office, 3, Victoria Mansions, Victoria-street, London, S.W.

DOMESTIC POISONS, THEIR DETECTION AND ANTIDOTES.

By AN ANALYST.

IN our own, and most other civilised and densely populated countries, the essential necessities of human life are all more or less poisoned. The air we breathe is mixed with noxious gases and fumes, arising from the combustion of coal and manufacturing operations. Nor are our meat and drink more pure; and, besides, there are the germs of many diseases, which recent investigations have taught us to look for everywhere. That this affects the average duration of life can hardly be doubted. When the contaminations rise above certain limits it is painfully evident; as in the pale faces and premature old age of those compelled to live in the dirt and squalor of dark and damp cellars in the crowded courts of all our great cities, and from the epidemics which have been clearly traced to bad water, bad drainage, or the consumption of diseased food. Unfortunately the only remedy for this, the most destructive form of domestic poisoning, is the limitation of the contamination to the lowest practical

point—a remedy that can only be arrived at by the most scrupulous cleanliness on the part of the whole population, better sanitary arrangements, and a wider knowledge of the laws of health. With this part of the subject we do not in the present paper purpose to deal. Our attention will be confined to a few brief notes on the commonest of those substances which are capable, even in very minute doses, of destroying life or causing severe suffering, and which are more popularly termed poisons.

The progress of chemistry in recent years has been so great that many substances entirely unknown a hundred years ago, at least outside the laboratories of chemists, are now produced in enormous quantities, and employed in numerous manufacturing operations. Many of these are violently poisonous; and thus, although the deaths due to poison wilfully and wickedly administered are probably much fewer, the actual number of deaths, and of persons who suffer from poison, is continually increasing, owing to the greater liability to accidents and mistakes.

I.—MINERAL AND OTHER IRRITANT POISONS.

Poisons may be conveniently divided into two classes:—Irritants and narcotics. The former are principally derived from mineral sources; and act chiefly by corroding and irritating the gullet, stomach, and intestines; or by absorption into the tissues and blood, and so altering or destroying the vital functions. With most of them two kinds of poisoning occur. When a quantity sufficient to cause death is swallowed, severe pains are soon felt in the abdomen, followed by nausea, vomiting, and other symptoms peculiar to the different poisons. Medical men call this acute poisoning. But when smaller and even harmless doses are taken repeatedly and constantly, the poison appears to accumulate in the system, and finally produces serious suffering and even death. This chronic poisoning is often very difficult to distinguish from disease, though in most cases there are certain marks which indicate the cause of the suffering to experts. This is all the more important as the only effectual remedy is the removal of the source of the poison.

Recovery from acute poisoning on the other hand depends on the prompt administration of antidotes, or the removal of the poison from the stomach. The latter is by far the most important. Fortunately most of these poisons in large doses naturally produce vomiting, and on discovering that a person has swallowed poison, the first thing to do is to assist this action by an emetic. A convenient material for this purpose is mustard made into a thin cream with warm water. Two or three spoonfuls of this will usually produce the desired effect, and it should be repeated every few minutes. The emetics may be assisted by oily or albuminous drinks, made from linseed-meal, raw eggs, and oils, with warm water; and along with these the appropriate antidotes. Hot greasy water may also be used to promote vomiting; but no time should be lost in getting a doctor, as the stomach-pump is usually superior to other means for clearing the stomach.

In the case of persons swallowing any of the strong acids, such as oil of vitriol or aquafortis, or the caustic alkalis, this treatment cannot be used. The lining membranes of the gullet and stomach are instantly destroyed, and a neutralising liquid must be administered. For acids the best and most convenient antidote is washing or baking soda dissolved in warm barley-water; and for the alkalis a mixture of strong vinegar and water. Unless these are swallowed without delay there is great danger of the mucous membranes swelling up and producing suffocation. A liquid even more dangerous than these is carbolic

acid, now largely used for disinfecting purposes. For it there is no known antidote, but its smell should be sufficient to warn anyone of its character; though neither the taste nor smell of any of these corrosive liquids are observed till too late, when hurriedly drunk. Accidents are, however, infrequent, and it is generally only in cases of suicide that they are swallowed.

In popular estimation arsenic is almost synonymous with poison, and practically the idea is just. There can be no doubt that this substance was the material oftenest used in the wholesale poisonings of the middle ages, especially where it was desired to get rid of obnoxious or inconvenient persons by slow and lingering symptoms which should have all the appearance of disease. At the present day it is about the last poison anyone, with any knowledge of the subject, would choose for murderous designs. In small doses its simulation of disease is, indeed, close, but a doctor could hardly fail to detect the difference, and with the slightest grounds for suspicion exposure is almost certain. Arsenic is now, however, extensively employed in the preparation of a great number of substances. Even where this is not the case commercial chemical manufactures often contain it as an impurity, owing to the employment of oil of vitriol and spirits of salt in their preparation. Drugs and articles of food are often contaminated in this way. White vinegar for instance has been found with traces of the poison. This liquid is now largely prepared from crude pyroligneous acid, and derives the arsenic from the oil of vitriol used in its purification. It is also not an unfrequent practice to adulterate vinegar with mineral acids. If these are pure, and only a small quantity is used, no great harm is done; but owing to the arsenic in the commercial acids the practice is dangerous, and vinegar which gets milky when mixed with a few drops of a solution of sugar of lead or lime water should be avoided. The same objection applies to the method of using carbonate of soda and hydrochloric acid in place of yeast in bread and biscuit-making. The acid used is never entirely free from arsenic. The dangers from these and similar sources are fortunately exceptional, as they can only assume an acute form where several circumstances combine to cause an extraordinary degree of contamination.

More serious troubles arise from the employment of arsenical compounds in the manufacture of pigments and colours, and in the operations of dyeing and calico-printing. The aniline colours, harmless enough in themselves, often appear to be poisonous, owing to arsenical contamination from imperfect or careless purification. A rather curious case of this kind occurred some time ago. A business man suffered from severe and continuous headaches. His doctor recommended him a week at the sea-side. The change produced the desired effect, but no sooner had he returned to town than the headaches recommenced. A holiday was again tried with complete success, only to be followed with a recurrence of the headaches a few days after his return to town. This went on for some months till the doctor began to suspect some external cause, and instituted inquiries regarding the food, drink, wall-papers, &c., but without success. At length the patient laid aside for a few days a hat he had always worn in town. The headaches ceased, but returned when the hat was again worn. Subsequent experiments left no doubt that the lining, coloured with a red aniline dye, was the source of mischief. Similar instances have been noticed, and the aniline colours have to some extent become objects of suspicion and distrust; but experiments have shown that most of the pure dyes have no injurious action on a healthy skin and

there can be little doubt such effects are really due to arsenical contamination.

Mothers ought, however, to be careful not to allow their infants to chew bright-coloured ribbons or other dyed fabrics. The colour-boxes that delight older children are, also, not entirely free from suspicion, even where they profess to be non-poisonous, as the paints are usually prepared from aniline colours. Every effort should be made to teach children the very difficult lesson of never on any account putting the paints or brushes into their mouths.

Leaving these indirect sources, which after all are only occasionally the causes of discomfort, and seldom of any serious mischief, we come now to substances which are wholly or partially composed of arsenic. Of these the arsenical pigments cause, perhaps, the greatest amount of suffering, though seldom leading to fatal results. None of them are at once more dangerous and more common than the bright and cheerful greens which, under various names—emerald green, Vienna green, grass green, Scheele's green, &c.—are so pleasing and soothing to our eyes. These are essentially compounds of arsenic and copper. Immense quantities of the pigments are manufactured and sold for all sorts of purposes. As paints no other greens can compete with them in cheapness, durability, or brilliant appearance. Mixed with oil and well varnished, no objection can be taken to their use for many purposes of house and garden decoration. But they are inadmissible in the kitchen, or on vessels, or stores for provisions. Yet such paints are often employed in a very rough form on the shelves of bakers' and grocers' shops, and cases have been known of loaves being sold with pieces of the paint, sufficient to poison more than one person, sticking to them. Their use in wall-papers, and especially in cheap "faced" papers, is better known. No other compound will produce, in as permanent a form, the peculiar grass-like green which gives bedrooms and sitting-rooms so bright and cheerful an appearance. Such papers, though cheap, are very roughly prepared. The pigment, mixed with chalk and sized liquid, is loosely stamped or painted on rough porous paper, and is easily rubbed off and diffused through the air of the room. The heat, too, vaporizes the arsenic; and the inmates often suffer from headaches, dryness in the throat and tongue, and severe depression, especially after the rooms have been newly-papered. Women, being oftener and longer in such rooms, suffer more than the other sex; and probably many of the headaches and much of the general prostration to which they are liable might be traced to this source. But it is not in bright green only that arsenic is found. The pigment is so cheap that it is mixed with many others to give different shades of bluish green, grey, &c. As a rule the arsenical nature of these papers can be easily detected. If pieces of the paper are laid on white sheets of paper, and a few drops of ammonia or spirits of hartshorn are poured on it, arsenical greens give, in a few minutes, a greenish yellow ring on the edges of the liquid. The same green pigments are employed to colour wax candles and tapers. When a great number of these lights are burnt, the air of even a large room is poisoned, and produces the usual headaches and nausea. A still more reprehensible use of the pigments is in colouring confectionery and children's toys. In France, Belgium, and some other countries this is prohibited, and in our own country their use in articles of food is illegal. But the law is not efficiently carried out, and there is nothing to prevent their use on toys, and for colouring the papers and ornaments on sweets; while the fancy articles common at Christmas and other festive occasions are still oftener poisoned. Careful attention should be given to children's sweets and toys, and anything

suspicious should be at once confiscated. Colour boxes, and the small capsules now so common, also often contain arsenical colours. Young artists of both sexes are apt to get their faces and fingers smeared, and it is no uncommon practice to assist the mixing by a copious application of saliva to the brushes; while, if left in the way of very young children, the chances are that they will find their way to that universal infant receptacle—the mouth.

White arsenic is itself used for various purposes about the house. Either alone or mixed with sugar and other substances, it is used for rat poison; and it is often employed in preparing animal and bird skins for stuffing. By farmers it is used to prepare sheep washes, and for steeping grain to preserve it from mould. The purchasers of these articles are not always aware of their dangerous qualities, but more often accidents arise from mere carelessness, and a preference for *Aunt Dinah's untidy* habit of keeping things handy. Arsenic is very similar in appearance to salt or powdered sugar, and a parcel of it kept any way near these articles may be innocently thrown into soup, or coffee, or other articles of food; or children on an exploring expedition may hastily swallow it in a mistake for sugar. Fly papers and fly powders are even more dangerous if left in the way of young children, as they are usually prepared with mixed sugar and arsenic, and have a sweet taste. Yellow compounds of arsenic are also used as paints, and in the manufacture of fireworks, but they are not quite so poisonous.

The amount of any of these forms of the poison that may be taken without producing dangerous symptoms varies exceedingly, depending on the form and actual amount of the poison present. In solutions less than half a grain produces very severe symptoms, and anything over a grain may cause death. The dry substance is not so active, but a grain is a dangerous dose. With larger doses the characteristic symptoms—nausea, shivering, pain in the stomach, and violent headaches, with vomiting—usually show themselves in less than an hour. After assisting the vomiting by emetics and otherwise, as already described, mixtures of gum water, beaten up with raw eggs, should be alternately administered with a mixture of hydrate of magnesia and persulphate of iron. When these are not at hand, a mixture of lime water and olive oil, and even of chalk or magnesia shaken up with milk, have been found useful. The so-called "lime-juice and glycerine" hair-wash may be given in an emergency. It is really a mixture of oil and lime water with lemon flavouring. When large doses have been swallowed recovery depends chiefly on copious vomiting, or the use of the stomach pump. The violent symptoms are usually followed by nervous irritability and headaches, and patients must be treated for several days with strong purgatives—castor oil or Epsom salts—in order to eliminate the last traces of the poison from the system; otherwise they may suffer from its effects for months or even years. Notwithstanding its extremely poisonous character, arsenic is used in medicine in very minute doses, especially for skin diseases, and ladies occasionally employ it, either internally, or as a cosmetic, to give a clear and bright complexion. Extreme care must, however, be taken, and its use is never without danger. Doses which will have no effect on most persons produce alarming symptoms in others, and it should never be employed except under medical advice.

(To be concluded.)



DOMESTIC POISONS: THEIR DETECTION AND ANTIDOTES.

By AN ANALYST.

A POISON somewhat similar to arsenic in its effects is phosphorus. Accidents and suicides from this substance were formerly somewhat common, owing to its use in the preparation of lucifer matches. But some years ago it was fortunately discovered that its poisonous qualities could be easily destroyed, while at the same time it is rendered more handy and useful for commercial purposes. Poisonous matches are now rarely met with, and rat poisons are almost the only means through which accidents from this source can occur. It is fortunate this is so, as no antidote is known, the only remedies being those generally applicable for the promotion of vomiting.

Corrosive sublimate is a white powder not unlike arsenic in appearance, and its poisonous properties are also similar. Both are occasionally sold by mistake for tartar emetic, magnesia, powdered tartaric acid, and other substances to which they bear more or less resemblance. This and other salts of mercury are also often sold in quack mixtures for polishing plate and Britannia-metal goods; and they are employed for preserving collections of stuffed birds, animals, and insects. In addition to the other symptoms, mercurial poisons corrode the animal membranes, and produce abundant salivation, and ulcers in the throat and mouth. A few mercurial paints, as vermilion and cinnabar, are used; but they are not violently poisonous, and cases of chronic poisoning are almost wholly confined to the use of quack medicines. The poisonous salts are very soluble, and, unless speedily expelled, soon pass beyond the reach of antidotes. Of these beaten eggs, and a thick paste of flour, milk, and water are the most useful; and to check the salivation doses of chlorate of potash dissolved in water are given.

About no poisons have there been more discussions than the lead salts. Fatal results are practically confined to two of these, sugar of lead and white lead. The latter is more frequently fatal to cattle and other animals than to men, but cases have been known of the dry paint being mistaken for magnesia, bicarbonate of soda, and chalk. Sugar of lead is employed about the house for various purposes, and it is rather a dangerous substance to leave in children's way owing to its great resemblance in appearance, and even taste, to sugar. Pretty large doses are required to produce serious trouble, and both salts act as emetics. Epsom salts in pretty strong doses is the most convenient antidote, and the purgative action is of great assistance in relieving the obstinate constipation and colics which are the most characteristic symptoms of this kind of poisoning. Chronic lead-poisoning is, however, a more interesting subject. No poison has so great a tendency to accumulate in the animal tissues, and even very minute doses ultimately cause paralysis of the limbs, and other dangerous symptoms. Great importance has thus been attached to the action of water and other liquids on lead pipes and vessels. All vegetable acids readily dissolve lead, and care should be taken not to allow fruits or fruity juices to stand in vessels where it can come in contact with lead or solder, neither should beer, cider, or similar drinks be stored in lead or pewter vessels. Although undoubted evidence of the outbreaks of what is known as lead colic have been traced to contaminated drinking water, exhaustive investigations have shown that there is not after all very much danger in lead piping. Distilled water and rain-water act pretty strongly on lead, and all natural waters act more or less on bright surfaces of the

metal; but the action soon ceases, owing to the formation of a protecting coating. Soft peaty waters act strongly at first, but the pipes soon become coated. Hard waters, such as those supplied in London, are practically without any action at all; but impure waters containing sewage, or other organic matters, form no protecting coating, and are often found to contain traces of lead. Where possible, it is always advisable to allow the water to run continuously for a day or two through new lead pipes. After this, unless it is otherwise unfit for use, there is no great danger. Even the external application of lead is dangerous, and for this reason most hair dyes, many cosmetics and quack medicines are highly objectionable. Chronic poisoning from lead produces a peculiar bluish line on the gums, and a greater or less blackening of the teeth. Frequent doses of Epsom salts and sulphurous baths are most useful when the source of poisoning has been removed.

Small quantities of copper salts are often employed to give preserved peas and other vegetables a fresh green appearance. Naturally these substances cannot retain a good colour for any length of time, and bright green tints should be looked upon with suspicion. More danger is to be apprehended from the green verdigris, which forms on copper utensils left damp and dirty. This is more especially the case if the vessels retain traces of saline liquids or fruit juices. Singularly enough the common fruit acids do not dissolve copper while hot, and copper vessels may be used with perfect safety if care be taken not to allow the liquids to cool in them. Copper salts are all strongly emetic, and seldom cause very serious trouble. In acute cases sugar and raw eggs are the best remedies.

Oxalic acid and some of its compounds are employed under the name of "salts of sorrel" or "salts of lemon," for removing rust and ink stains from linen, and for bleaching straw, &c. These substances are intensely poisonous, and as they greatly resemble Epsom salts, they have occasionally been taken in mistake for that medicine. Except for the common habit of swallowing medicines right off, the strong bitter acid taste would warn anyone of the mistake. If speedily administered, lime-water, fluid magnesia, or even mixtures of magnesia, or chalk, and water are very perfect antidotes.

It is this acid which gives the sour taste to rhubarb, and that article should not be too largely indulged in, as instances have been known of the plants containing a poisonous quantity.

Some of the most dangerous of these poisons, we have already said, nearly resemble in appearance such harmless substances as baking soda, salt, tartaric acid, Epsom salts, and sugar. The taste will usually serve to distinguish them, and there is no great danger if only a minute portion be placed on the tip of the tongue, care being taken not to swallow it. This is not, however, always an agreeable or satisfactory method, and a safer plan is to place a small quantity of the substance on a table-knife or iron spoon, and to heat this carefully over the gas or lamp. The most virulent poisons—oxalic acid, arsenic, and the mercury salts—will almost entirely disappear in a few minutes; while Epsom salts, salt, and soda will simply be fused. Sugar and tartaric acid will swell up to a brownish-black mass before disappearing. Tartar emetic, which is poisonous in large doses, will also turn black, but a whitish residue will be left.

II.—NARCOTIC AND OTHER VEGETABLE POISONS.

The poisons we have described act chiefly as we have seen by setting up rapid inflammation in the tissues with which they come in contact. A few of them affect the nervous

system and the brain, in a greater or less degree; but not to anything like the same extent as do the narcotic poisons. These are chiefly obtained from vegetable sources; they are usually prepared only in small quantity; and they are seldom employed otherwise than in medicine and surgery. As a rule they are much more violently poisonous than the metallic compounds; and as their characteristic symptoms are not developed till they have been absorbed by the blood, recovery from poisonous doses is much less frequent. The effects of this kind of poisoning usually commence with giddiness, dull headaches, and vague feelings of alarm. These are followed by insensibility and coma, accompanied in some cases with violent convulsions and paralysis.

As most of them can only be obtained for medical purposes, very few of these poisons will require any detailed notice. Of those of which a short description will be useful the first and most important is opium and its various preparations. To this poison official statistics assign almost as many deaths as are caused by all other poisons together, and there is hardly room for doubting that several hundreds, if not thousands, of children, not included in the official statistics, are annually poisoned by over-doses of opium preparations. Opium itself is the juice which exudes from the green capsules of several varieties of poppies dried and hardened in resinous lumps. The actual poisons are a number of peculiar bodies called alkaloids, of which morphia is the most important. In opium this is found in combination with another substance called meconic acid. The actual quantity of the poison in different samples of opium varies greatly. Bengal opium contains on an average about 2 per cent., other East Indian varieties from 5 to 9 per cent., and Turkish opium about 6 per cent., while the Smyrna or Asia Minor variety contains from 10 to 15 per cent.; but the amount also varies with the age of the poppies and the method of gathering. These variations constitute an element of some danger. Most druggists make up their preparations from given weights of opium, and do not always even know the kind of opium with which they are dealing. Fortunately, the percentage of morphia is more likely to be under than over the assumed strength; and, besides, a large proportion of the laudanum is now prepared by wholesale druggists, who adopt means of ascertaining the real amount of poison in their opium.

But this introduces a new danger. Laudanum is simply a solution of opium in weak alcohol, and unless it is kept very carefully in well-stoppered bottles, the alcohol evaporates and makes the laudanum stronger than is wished. For the same reason this drug should never be used after having been kept for months or years in a corked vial, but should be obtained fresh as required. Besides laudanum, opium is the basis of most soothing syrups, pargorics, balsams, and other mixtures for soothing and inducing children to sleep. Properly administered, there is probably no medicine more useful than opium preparations. But the strength of these "patent medicines" is apt to vary very seriously, and fatal accidents from over-doses are very common, as well as from the practice of repeating small doses in a sort of desperation, when the ordinary effects are not at once produced. Children are often poisoned in this way, and it is generally unadvisable to allow persons suffering from severe pains, and those in immediate charge of sick children, to have possession of large quantities of these opiates. The symptoms of poisoning, which commence with giddiness, drowsiness, and an irresistible tendency to sleep, are usually overlooked, and no alarm is felt till the sufferer falls into a decided stupor, quickly succeeded by insensibility, and later by slow, stertorous

breathing; the countenance becomes pale and ghastly, with livid lips; generally there is profuse perspiration. In the case of adults death ensues in twelve to forty-eight hours. The symptoms come on more rapidly with children. Death generally occurs in a few hours, and is often preceded by convulsions. When the mistake is discovered in time, the usual emetics may be given; and every effort should be made to overcome the tendency to sleep and stupor till a doctor can be procured to apply the stomach-pump. Cold water may be dashed on the head and back, the feet and hands sharply switched or pinched, and where convenient shocks may be given by an electric machine, the patient being kept constantly moving. To rouse children, a warm bath in which they can be alternately plunged and then exposed to cold air is recommended. Very little is known of any positive remedies. Having got the stomach cleared out, a strong decoction of tea or coffee may be given, and camphorated spirits, brandy, and oak-bark infusion have been advocated, as well as a solution of iodine in iodide of potassium; but the chief reliance must be placed on the prevention of sleep and stupor.

A curious feature of this poison is that if constantly taken it gradually loses its more prominent effects, and after a time doses may be used with impunity that would prove fatal to three or four persons not accustomed to its use. De Quincy tells us that he could at one time consume nine ounces of laudanum daily, and Sir Robert Christison mentions a person whose daily allowance was three pints; while half an ounce of this mixture has been known to cause death.

The practice of opium-eating, or more properly laudanum-drinking, there is too much reason to fear, is becoming common in large cities and some districts of England. About Norwich and some other parts of the eastern counties it is so general that druggists have become used to supplying their regular customers without the necessity of asking questions; and one trader a few months ago, when prosecuted for an infringement of the Excise regulations, excused himself on the plea that the wood naphtha he mixed with his spirits rendered the laudanum more agreeable to the tastes of his customers. Like the opium-smoking of the Chinese, it is a practice which it is very difficult to discontinue when it has been indulged in for any considerable time. There are grounds for believing that in a very few instances this habitual use produces no very marked effects, but in the majority of cases an insatiable craving leads to continually increased doses and very marked effects. Food is loathed, and the digestive organs are thoroughly deranged; the countenance becomes of a yellow tinge, with hollow, sunken eyes, and the body more or less bent and emaciated. Another method of chronic opium-poisoning which has lately become common among physicians and other educated persons, is the continual resort to hypodermic injections of morphia. The practice is a convenient and useful means of giving almost immediate relief in severe attacks of neuralgia and rheumatism, and in other cases of severe pain; and this has tempted many persons to use it on all sorts of trifling occasions, and even as a remedy for nervous depression and worry or anxiety of mind. The habitual use of this form of the drug produces even more rapid and marked effects than laudanum.

It is not necessary to refer to alcoholic poisoning. Accidents from the ordinary strong spirituous liquors, as well as from spirits of wine, methylated spirits, and camphorated spirits are not unknown, but are mostly confined to children, and are best met by strong emetics accompanied by cold water affusions,

ammonia vapour, and other methods of preventing stupor. Similar treatment may be applied in cases of an over-dose of chloral hydrate, another very useful sleep-producing agent, but which is now being almost as much abused as opium. The practice of constantly giving infants opium or other sedative powders or mixtures cannot be too strongly condemned. Extremely minute doses often produce fatal results, and the habitual use of opiates must eventually kill the greater proportion of the children who are operated upon. Quack preparations are especially dangerous, and none are more so than chlorodyne—a mixture largely used by all classes. This contains several deadly poisons in by no means constant proportions, and the liquid is apt to separate into two layers, so that any want of care and attention may easily lead to accidents. Used in moderation and under proper advice, it is a useful medicine, but it may be doubted whether its unrestricted sale under the present "patent medicine" regulations is wise.

Among the components of chlorodyne is prussic acid, perhaps the most deadly poison known. The effects of this poison in fatal doses—extremely small quantities—is swift and terrible. As a rule death is practically instantaneous. It is extremely volatile, and the vapour is almost as poisonous as the liquid. Several lamentable deaths have been due to inhaling this vapour, notably that of its discoverer, the celebrated chemist Scheele. The solution employed in preparing medicinal prescriptions contains only from 2 to 5 per cent. of the pure substance, yet a few drops of this liquid spilt on a dress or table gives off fumes which have been known to cause insensibility for hours. Notwithstanding this fearfully poisonous character, in minute doses of one fiftieth part of a grain or less, it is a useful medicine in certain diseases of the stomach; and it has been employed in cholera cases with advantage, as well as externally in some skin diseases. It is occasionally employed to kill cats, dogs, and other animals, but accidents occur chiefly among chemists and others who have occasion to handle it.

Several preparations employed for toilet purposes, however, and for flavouring confectionery and other articles of food, contain more or less of this poison. Among the best known of these are bitter almonds, and the various oils and essences obtained from this fruit, such as ratafia, peach-nut oil, etc.; and also laurel, peach, and passion-flower water. Some of these are hardly less poisonous than the ordinary solution of prussic acid. From the dilute solutions usually employed for almond-flavouring, there is not great danger, provided the articles of food are subsequently boiled or baked. The heat expels the poison without entirely driving off the essential oils to which the flavour is due. For dishes that do not require heating such materials should not be employed, especially as the same flavour can now be obtained in a much less dangerous form from nitrobenzol, an oily liquid prepared from coal-tar. In any case great care should be taken not to use more than a few drops of these flavouring essences. Small quantities give just as good results as can be obtained from those which often produce unpleasant symptoms.

Many people are not aware of the deadly nature of some of these sweet-smelling essences and washes, and a number of fatal accidents have occurred from their improper use or through mistakes. The poison acts so rapidly that remedies are often useless. The symptoms sometimes begin in the act of swallowing, and almost always in a minute or less after taking a large dose. The limbs lose their muscular power, and the sufferer falls insensible. The eyes are fixed and glistening with dilated pupils, the jaws are locked with frothing at the mouth, the breathing being a

series of convulsive gasps at long intervals, during which life is apparently extinct. There is no power of swallowing, or any possibility of using the stomach-pump; and the only chance of recovery is by pouring cold water from some height on to the head and spine, and the application of ammonia and other stimulants to the nostrils. In smaller doses, where a minute or two may elapse before the dangerous symptoms appear, a solution of copperas should be immediately swallowed, and sal volatile is also recommended; but chief reliance must be placed on the cold water treatment.

A number of other plants and fruits, as well as the bitter-almond, and laurel leaves, yield prussic acid. The kernels of the peach, cherry, and damson, and even apple-pips, are all poisonous, and the death of children has been known to occur through eating largely of cherry kernels. Manioc root, from which tapioca is prepared, is also highly poisonous; but during the manufacture the prussic acid is driven off by heat.

A compound of prussic acid—cyanide of potassium—almost as poisonous as itself, is largely employed in electro-gilding and plating, and in photography, and sometimes for cleaning electro-plate and silver ornaments. The same compound has occasionally been issued by dispensers for harmless substances, especially for the yellow prussiate of potash, owing to a certain amount of confusion among doctors as to the peculiar dog-Latin phrases by which they distinguish the two substances. But the smell of this compound is so characteristic, and the taste so nauseous, that accidents are likely to occur only through great carelessness. Care should, however, be taken by those who use it not to allow the solution to come in contact with any cuts or wounds in the hands or fingers; and it should never be heated, or even left exposed in any large quantity, as it readily exhales the deadly fumes of prussic acid.

Of late years a number of poisonous principles have been extracted from other plants, and are employed for various purposes in medicine. Some of these bodies are even more powerful poisons than prussic acid, but accidental poisoning can only occur through mistakes of dispensers, or among those handling the drugs, and such cases are extremely rare. Some notorious murder trials have resulted from the use of some of these for criminal purposes, notably strychnia, and more recently aconitia. Fatal results from eating the leaves, root, and fruits of the plants yielding these alkaloids, as they are called, are much more common. Various species of hemlock have been mistaken for parsley, and the monkshood root, yielding the deadly aconitia, is sometimes used for horseradish; while the bright-coloured berries of the different nightshades, of the yew, and of several other plants are frequently eaten by children. There are no good antidotes known for these poisons, and such cases are best met by the free administration of strong emetics, followed by doses of castor oil. The poisonous principles are only slowly extracted from the vegetable matters, even in the stomach, as most of the roots, leaves, and berries are eaten in a raw, indigestible form; and if they can be quickly expelled there is, as a rule, speedy recovery. Should alarming symptoms of stupor or convulsions be developed, cold water and other stimulants may be applied, as in the case of prussic acid.

We have only referred incidentally to the use of these poisons for criminal purposes. Some of them were doubtless known to a select few of former ages, and many persons have been alarmed at the probable consequence of an extension of this knowledge; but experience has shown that such fears are groundless. When their characteristics and effects

were secrets known only to one or two, they might be used for criminal purposes with impunity, and detection defied. Better knowledge has placed them within the reach of greater numbers who might be disposed to make a bad use of them, but it has to a much greater degree increased the chances of discovery and punishment. No matter how skilfully poisons may be used, and what-*ver* precautions may be taken, modern science, as recent trials have shown, is capable of detecting their presence;

and in this lies our safety. Doubtless, greater legislative restrictions might with advantage be placed on the sale of many of these drugs; and some murders or attempted murders might be prevented if those who have occasion to use these poisons took sufficient care to keep them securely locked up. Easy access to the means is probably often a great temptation to persons of an excitable, vindictive, or passionate character; and hence the cases of poisoning which sometimes occur from very trivial

quarrels. However this may be, there can be no question that carelessness and ignorance are the main causes of accidental poisoning; and our object has been chiefly to point out how accidents may occur from articles in more or less common use in the household, and the methods of treating such cases, together with the sources from which our food and drink may be contaminated to a less dangerous, but still to a disagreeable and troublesome extent.
C. PROCTOR, M.S.C.I.

ROBINA CRUSOE, AND HER LONELY ISLAND HOME.

By ELIZABETH WHITTAKER.

CHAPTER XLI HOPES AND FEARS.

WE reached home in safety, greatly to Undine's delight, who had passed some anxious hours during our absence, and I was glad when, after bringing in our new possessions, I could lie down to rest. But sleep was not to be mine; old memories, recent events, all crowded in upon my thoughts. That wretched creature lying ill alone upon the sea, was his conscience upbraiding him? My letters, would they ever be read by the dear ones addressed? My two children, would my influence over them be all it should be? My precious father, had he been really nearer to me than I thought? Had his spirit been a ministering one to mine?

We employed the following morning

in putting away our new acquisitions, which were very miscellaneous. We brought all the firearms we could find. I also secured a large amount of cord and sailcloth, and tools, besides some household stores. Henry took his father's and his own garments, and some little things he prized, and we fastened one of the ship's boats to ours and towed it back. So that our booty was very valuable, though I do not think anything gave me personally more pleasure than my paper.

We saw one of the parties on search pass along the beach, and thinking it well

to give them a fright, Henry ran up to the top of our entrance gully and fired the signal they had agreed upon—the three shots. Undine and I, watching from the armoury window, had the satisfaction of seeing the men run off in the direction of the sound, and we amused ourselves with picturing the astonishment that would be felt by both parties when they met, and the amazement they would experience upon finding the robbery committed on the vessel. They would begin to fancy some uncanny beings inhabited the place—able to make themselves invisible at will, for their mate would be quite unable to tell them whence the arrow came that struck him down, as I had been completely concealed from his view. At any rate, it had the effect

of deterring them from remaining any longer on the land, for a few hours later we had the gratification of seeing the vessel round the farthest extremity, and I watched her with mingled hopes and fears until she was lost on the horizon.

And now we resumed our customary way of life, excepting that we had a very pleasant and useful addition to our family in Henry, so strong, yet gentle, so kind-hearted, yet manly. To him was intrusted the replenishing of the larder, as he proved an able sportsman.

One of our undertakings at this time was the reparation of Banyan House, which the sailors had knocked about and injured, but I was very glad to find they had not done damage to my farm-yard by the lake.

Henry proved very useful in ridding the land of some of the wild cats, many of whose beautiful skins he managed to dress most skilfully, and with them and those of some other animals we adorned the floor of our great hall at the castle, making it look quite luxurious.

I forgot to mention we had brought with us as many books as we could carry from the captain's library, some good



"WE BROUGHT ALL THE FIREARMS WE COULD FIND."



"DRINKING IN EVERY WORD."