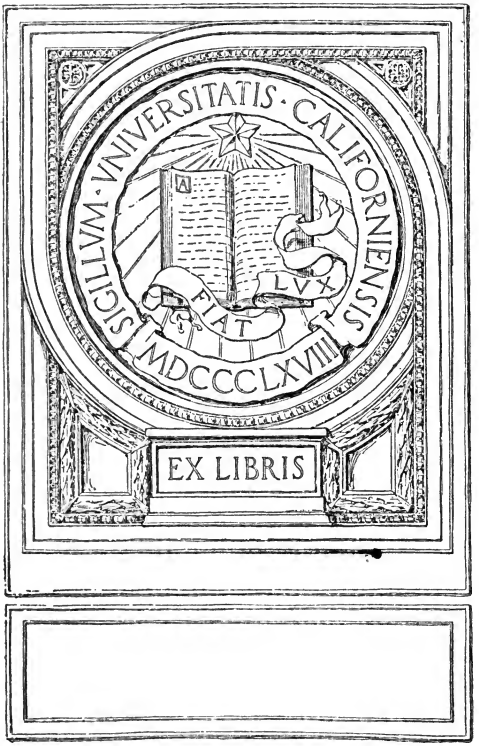
FIRST AID IN THE LABORATORY AND WORKSHOP

ELDRIDGE AND ERISCOE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FIRST AID IN THE LABORATORY AND WORKSHOP

BY

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WITH A FOREWORD BY

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FOREWORD

BY

SURGEON-GENERAL SIR ALFRED KEOGH, K.C.B.

It often happens that persons who have attended courses in First Aid find, in an emergency, that they have forgotten the treatment appropriate for any particular injury. The authors of this little work have had much experience of injuries in chemical and mechanical laboratories at the Imperial College and elsewhere, and they have found that there is a need for a work of reference as an aid to memory. Since the recognition of the necessity for this handbook is the outcome of experience, perhaps no more need be said to commend the attempt which has been made, but it is obvious that the essential thing in most cases, where First Aid is required, is rapidity of action.

Many handbooks are prolix, suitable only for the study and not for the laboratory; this little book, if at hand, will tell in an instant what should be done.

A. K.

PREFACE

THE authors have, for a considerable time, been in charge of the First-Aid organization in chemical and physical laboratories, and they have found that the existing books on First Aid are not entirely suitable as guides to action in dealing with many of the accidents which they ordinarily encounter. These books devote a considerable amount of space to serious fractures, etc., with which one seldom meets in the special cases now under consideration, and give but little information as to the treatment of burns produced by chemical agents, injuries to the eye, poisoning, etc., which are of more frequent occurrence.

In these circumstances it appeared to be of use to compile brief, clear directions for dealing with injuries and accidents such as are most likely to happen in laboratories and workshops. While they have used every endeavour to attain accuracy and to select the best treatment for each case, the authors would welcome any criticism which would enable them to effect improvements.

The authors further desire to acknowledge their indebtedness to many standard works upon First Aid and Poisons, and especially to Dr. James Cantlie's "First Aid to the Injured," Blyth's "Poisons, their Effects and Detection," and Hale White's "Materia Medica."

A. A. E.
H. V. A. B.

SOUTH KENSINGTON,
October, 1915.

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FIRST AID

IN THE

LABORATORY AND WORKSHOP

GENERAL INTRODUCTION

In the treatment of accidental injuries there are a few general points of importance to which attention must always be paid.

I. **Do not move the patient** unless it is absolutely essential to do so—*e.g.*, to remove from electrical contact; to provide fresh air, etc.

II. **Avoid delay** in applying treatment, especially if the patient is unconscious.

III. **Give no solid or liquid by the mouth while the patient is unconscious.**

IV. **First arrest hæmorrhage**, and afterwards attend to any other injuries.

V. **Cover all wounds** as speedily as possible with an aseptic or antiseptic dressing.

VI. **Send for a doctor** unless you are quite certain that the injury is of the very slightest character; accompany your request by a brief *written* statement of the nature of the accident and the condition of the patient.

VII. **When in serious doubt** as to the correct thing to do, **do nothing**, except send for the doctor.

MATERIALS

A suitable cupboard containing the following articles should be placed in a readily accessible position, preferably close to a hot and cold water supply:

A. *Bandages, triangular and roller.
*Boric lint.
*Brush, camel-hair (small).
Cotton thread.
*Cotton wool (absorbent).
Court plaster.
Cyanide gauze.
*Eye-bath.
*Glasses, graduated.
Linen, surgical.
*Needles.
Oiled silk.
*Pins, safety.
*Plaster, adhesive.
*Scissors.
Sponge (small).
*Teaspoon.
*Thread.
Tumbler.

* For the convenience of those who do not desire to obtain a complete outfit, those articles which we consider essential are marked with an asterisk.

B. *Adrenaline. "Tabloid" Hemisine; for use dissolve one in 5 c.c. water (the solution does not keep).

*Alcohol.

*Alkaline wash for the eye. (5 gms. borax + 1 gm. sod. carb. in 100 c.c. water.)

*Arnica, tincture of.

*Boric acid (powder).

*Boric acid, saturated aqueous solution.

*Boric ointment. (10 per cent. boric acid in white vaseline.)

*Carbolic acid (phenol). (3 per cent. aqueous solution.)

Carbolic vaseline. (1 per cent. phenol in white vaseline.)

*Epsom salts, magnesium sulphate. Dose (single), ¼ to ½ oz. (7 to 14 gms.); repeated, 2 to 8 gms.

Ether.

*Friar's balsam.

*Ferric hydroxide.

Keep separately a solution of ferric chloride, 50 gms. per litre, and one of ammonium carbonate, 50 gms. per litre. For preparation of fresh ferric hydroxide, mix equal volumes; filtration is unnecessary.

Ferrous sulphate.

Ipecacuanha wine. Dose, 1 teaspoonful every 15 minutes.

Lime-water, clear.

Magnesia, freshly precipitated, in water.

B. *Milk powder.

*Mustard. Dose, 1 dessert-spoonful in a tumblerful of warm water.

Oil, olive.

*Oil, carron. Equal proportions of linseed-oil and lime-water, well mixed.

*Oil, castor.

*Picric acid. Saturated aqueous solution.

*Salt, common.

*Sal volatile. Dose, 1 teaspoonful in a wine-glassful of water.

*Smelling-salts.

*Sodium bicarbonate. (Saturated aqueous solution.)

Sodium sulphate (Glauber's salt). Dose, single, $\frac{1}{4}$ to $\frac{1}{2}$ oz. (7 to 14 gms.); repeated, 2 to 8 gms.

*Starch, soluble.

Vaseline, white.

*Zinc sulphate. Dose, 1 gm. in a tumblerful of water.

CUTS AND WOUNDS

Cleanliness is essential in the treatment of wounds. All materials coming into contact with them (including the operator's hands) should be either **aseptic** (free from dirt and germs—*e.g.*, *clean* linen, paper, cotton-wool, water, etc.), or **antiseptic** (treated with or containing substances capable of killing germs; such as boric acid solution, boric lint [pink], cyanide gauze [violet]).

Two main cases arise, in which the essential points of **treatment** are as follows:

A. SLIGHT WOUNDS,

which can be healed by simple means, without the assistance of a doctor.

I. **Clean the wound,** removing glass or other foreign bodies, if present.
II. **Stop the bleeding.** (See p. 12.)
III. **Cover and bandage,** so as to protect from mechanical injury and germs.

B. SERIOUS WOUNDS,

requiring treatment by a doctor.

I. **Stop the bleeding.** (See p. 12.)
II. **Keep the wound covered,** until the doctor arrives.
III. **Treat shock,** if it occurs.

STOPPING BLEEDING.

The following are the usual methods, beginning with the simplest and passing to the most drastic.

For ordinary bleeding—

I. **Wash cut in cold water,** dry off, cover with boric lint and bind up.

II. **Apply gentle pressure** for a few minutes, cover with boric lint and bind up.

For more serious bleeding—

III. **Apply Friar's Balsam liberally** to the cut, and bind up fairly tightly.

IV. **Elevate the injured part** above the level of the heart, if possible.

V. **Apply pressure at the seat of injury** by the fingers, or by pad and bandage, and then—

VI. **Apply pressure** (1) to the arteries, at "pressure point," nearest the wound on side *towards* the heart; or (2) to veins, by a ligature round the limb on side of wound *remote from* the heart.

VII. **Apply adrenalin** (p. 9) to arrest serious **capillary bleeding,** as from a large shallow wound, persistent bleeding from the nose, etc.

BURNS AND SCALDS

N.B.—A *slight degree* of injury may be *very serious* if it extends over any *considerable area.*

The chief danger is shock. (See p. 18.)

BURNS BY DRY HEAT AND SCALDS.

Carefully cut away loose clothing; leave the parts which stick to the skin, and saturate them with oil.

Avoid breaking blisters.

Cover immediately with lint or linen saturated with carron oil (or with oil, boric ointment, cold cream, etc.). Apply in strips, if to a large area. The object is to **exclude air.**

Cover with layers of cotton-wool.

Bandage lightly to retain dressings.

Treat shock (p. 18).

For slight burns, apply picric acid solution, to relieve pain.

BURNS BY CORROSIVE ACID.

Wash immediately with COPIOUS STREAMS of water; small amounts of water are dangerous.

Bathe with weak alkaline lotion, such as alkaline eye-lotion, dilute solution of sodium bicarbonate, etc.

Treat as for ordinary burns. (See above.)

Treat shock, if it occurs.

BURNS BY CORROSIVE ALKALI.

Wash immediately with large volumes of water.

Bathe with weak acid (dilute acetic acid, lemon-juice, etc.).

Treat as for ordinary burns. (See above.)

Treat shock, if it occurs.

BURNS BY PHOSPHORUS.

DO NOT USE ANY OIL WHATEVER.

Apply dilute silver nitrate solution on wads of cotton-wool.

Cover to exclude air, with lint, cotton-wool, etc.

Treat shock, if it occurs.

Send for doctor.

BURNS BY BROMINE.

Wash with dilute solution of sodium carbonate.

Wash with alcohol.

Treat as for ordinary burns. (See p. 16.)

Treat shock, if it occurs.

EYE INJURIES

MECHANICAL,

as by broken glass, a piece of steel, etc.

Drop a little castor-oil into the eye, pulling down the lower lid for the purpose.

Close the eye, cover lightly with cotton-wool, and—

Bandage lightly, but firmly enough to keep the eye-ball steady.

Obtain medical aid as speedily as possible.

Note.—In case of dust or small solid bodies in the eye, if medical aid cannot easily be obtained, proceed as follows:

Seat patient in a chair, and stand behind him, with his head resting against your chest. Pull down the lower lid and remove solid with a camel-hair pencil moistened with glycerine or castor-oil. If the solid object is lodged under the upper lid, pull the lid forward and downward over the lower lid, and then release it so that its inner surface is brushed by the lashes of the lower lid. If several attempts by this method fail to dislodge the object, place a small round rod (round match, bodkin) along the upper side of the upper lid, seize the eyelash, and turn the lid back over the rod. Then get an assistant to remove the object with the brush.

BY ACIDS.

Wash well with alkaline wash, until pain is relieved, if injury is slight.

Drop a little castor-oil into the eye, and **close the lids.**
Cover with cotton-wool and **bandage lightly.**
Unless the pain is speedily relieved, send for doctor.

BY ALKALIES.

Wash well with boric acid solution, until pain is relieved, if injury is slight.
Drop a little castor-oil into the eye, and **close the lids.**
Cover with cotton-wool and **bandage lightly.**
Unless the pain is speedily relieved, send for doctor.

BY BROMINE OR CHLORINE.

Wash well with alkaline wash; this may be omitted if the injury is very slight.
Treat with VAPOUR of alcohol or alcohol+ether, applied by holding *near* the eye a cloth, etc., soaked with pure alcohol, or alcohol-ether mixture. (Do *not* allow the *liquids* to enter the eye.)
This treatment should be continued until the pain is relieved or medical aid arrives.

BRUISES

Apply ice or cold water bandages at once; do not rub the bruise.

Apply lint soaked in extract of wych-hazel ("Hazeline"). Arnica may be used if the skin is unbroken.

If skin is broken, treat as for cut (p. 11).

CRUSHED HAND OR FOOT

Fracture of small bones in hand or foot.

Cut off glove or boot carefully.

Apply well-padded splint over whole palm of hand (from above wrist to ends of fingers), or sole of foot.

Secure splint by narrow bandage in figure of eight.

Raise the limb; apply a large arm-sling; support the foot in a slightly-raised position.

Treat shock, if it occurs (p. 18).

SHOCK

Signs and Symptoms.—Pallor; cold, clammy skin; feeble pulse, shallow breathing; yawning and sighing; lowering of temperature of the body.

The chief aim of treatment is to prevent the body-temperature falling to a point at which life is endangered.

Attend to the cause—*e.g.*, stop bleeding from wounds, etc.

Loosen clothing about chest and abdomen.

Give fresh air.

Lay the patient down, with the head lower than the feet, if possible.

Give sal volatile and water, or allow to smell smelling-salts.

Keep the patient warm, by hot bottles, hot bricks, blankets, overcoats, etc. (**THIS IS VERY IMPORTANT.**)

Watch carefully, as the patient is liable to a sudden relapse after a temporary improvement.

If breathing appears to have stopped, apply artificial respiration (p. 30).

ELECTRIC SHOCK

Switch off current at main switch, if this can be done speedily.

Remove the sufferer from electrical contact, taking precaution to insulate yourself from shock. (*Dry* wool, silk, cotton, paper, etc., are non-conductors.)

Loosen clothing, especially around chest and abdomen.

Flick face and chest with a wet towel, to rouse patient.

Apply artificial respiration, if breathing appears to have stopped (p. 30).

ASPHYXIA (SUFFOCATION)

CAUSES.

1. **Swelling of tissues of throat,** as a consequence of poisoning by corrosive materials, scalding of the throat, or inflammation.

2. **Nervous affections,** which may be due to (*a*) narcotic and other poisons; (*b*) shock or collapse.

3. **Inhaling poisonous or non-respirable gases**—*e.g.*, carbon monoxide (fumes from charcoal or coke fires, producer gas, water-gas), or carbon dioxide (smoke, sewer-gas, limekiln-gas), or coal-gas.

TREATMENT.

1. **Remove cause,** or remove patient from cause. In case of swelling of the throat, apply hot fomentations to the front of the neck, give ice to suck or cold water to drink, and give repeated small doses of animal or vegetable oil.

2. **Give plenty of fresh air.**

3. **Apply artificial respiration** (p. 29). In case of poisoning by *carbon monoxide,* cause patient to inhale **oxygen diluted with air.** (Connect oxygen cylinder or other source of oxygen with a funnel held about six inches from patient's nose and mouth.)

POISONING

A. SYMPTOMS.

Poison.	Corrosion of Mouth.	Burning pain in Throat and Stomach.	Vomiting.	Giddiness.	Unconsciousness.	Convulsions.	Special Symptoms.
Acids, mineral	*	*					
Acid, carbolic	*	*					Numbness.
Mercury salts (corrosive)	*	*					Fainting. With non-corrosive salts, pallor, languor, fœtid breath.
Acid, oxalic...	*	*	*				Vomit contains blood; languor.
Alkalies ...	*	*	*				Vomit very alkaline and frothy, and contains blood.
Phosphorus ...	*	*	*				Breath may smell of phosphorus.
Ammonia ...		*	*	*			As for alkalies; odour of ammonia.
Chloroform ...		*			*		Numbness; facial pallor; delirium.
Carbon monoxide			*	*	*		Shivering; headache; respiration slow and rattling.
Cyanides ...			*	*		*	Confusion of sight; nausea; salivation.
Barium salts			*			*	Muscular weakness.
Zinc salts ...			*				Purging; prostration.
Aniline ...				*			Weakness; temperature low.
Camphor ...					*	*	Paralysis.
Alcohol ...					*		Facial pallor; odour of alcohol in breath; skin cold; pulse irregular.
Chlorine ...					*		Pain; smarting of eyes and nose.
Morphine ...					*		Pupil of eye almost vanishes.
Strychnine ...						*	Rigidity; tetanic convulsions.

B. TREATMENT.

Acid, Carbolic (Phenol).

1. **Emetic**: *Zinc sulphate, mustard,* or *ipecacuanha.*
2. **Epsom salts** (magnesium sulphate) or **Glauber's salts** (sodium sulphate); *white of egg.*
3. **Stimulants**: *Sal volatile* or brandy and water.
4. Guard against collapse by applying hot-water bottles and blankets. Watch the breathing.

The best antidote is any soluble sulphate. Chalk and water forms a good antidote.

Acid, Mineral.

1. **Much** *lime-water, magnesia-water, soap and water, or soda (not potash) carbonate.*
2. Olive-oil, milk, or white of egg.

Aconitine.

1. **Emetic promptly**: *Zinc sulphate.*
2. **Recumbent position**: **artificial respiration.**
3. Much weak brandy and water or whisky and water.
4. Hot bottles and blankets.

Alcohol.

1. **Emetic**: *Mustard* or *zinc sulphate.*
2. Keep awake by shaking, etc.
3. Keep body warm; head cool (cold water).

Alkalies (Ammonia, Potash, Soda).

1. **Emetic**: **Much** *lukewarm water;* alternatively, ipecacuanha wine or zinc sulphate.

2. Lemon-juice, weak vinegar, or dilute acetic acid.

3. Then, olive-oil, white of egg, barley-water, or arrowroot.

Ammonia.

See Alkalies

Antimony.

1. **Emetic** (if vomiting does not take place): *Zinc sulphate.*

2. *Frequent doses of strong tea* or 2 gms. of gallic or tannic acid in warm water.

3. Milk, thin starch paste, etc., and keep warm.

Arsenic.

1. **Emetic**: *Much tepid water* or *salt and water.*

2. Give *large quantities* of freshly precipitated *ferric hydroxide*, or much magnesia, or castor-oil and water.

3. Give olive-oil or white of egg.

4. Hot bottles and blankets to feet and abdomen.

The emetic chosen should be the least irritating available.

The ferric hydroxide may be prepared by mixing equal quantities of the specially-prepared solutions (see p. 9), and used without filtering, or by mixing laboratory solutions of ferric chloride and ammonium carbonate, and filtering through a handkerchief.

Atropine (Belladonna).

1. **Emetic**: Much tepid water or salt and water.

2. Hot bottles to feet; blankets.

3. *Artificial respiration* if necessary.

Alternate hot and cold douches are also recommended.

Belladonna.

See Atropine.

Benzene.

1. **Emetic**: Only necessary if benzene swallowed.
2. *Plenty of fresh air.* Artificial respiration if necessary.
3. Hot and cold water to chest.

Bromine.

As for Chlorine.

Carbon Monoxide.

1. **Fresh air.**
2. *Inhalations of dilute oxygen.* (See p. 20.)

Chlorine (*Inhaled*).

Inhale *alcohol vapour* or *ammonia.*

Chloroform.

If swallowed—

1. **Emetics immediately**: *Zinc sulphate* or *mustard.*
2. Large draughts of water containing a little *sodium carbonate.*
3. Keep patient **roused** by every possible means—shouting, hitting, bathing, etc.
4. *Artificial respiration* if necessary.

If inhaled—

1. *Plenty of fresh air.*
2. *Artificial respiration* immediately.
3. If heart stops beating, strike chest at once over heart.

A hot and cold douche may be applied with advantage.

Chromium Salts and Chromates.

1. **Emetic.**
2. Magnesia or chalk and water.
3. Demulcent drinks—*e.g.*, barley-water.

Copper Salts.

After vomiting, give *white of egg*, with much water or milk.

Cyanides.

See Prussic Acid.

Ether.

As for Chloroform.

Iodine.

1. **Emetics.**
2. Plenty of dilute starch paste or thin boiled rice.

Laudanum.

See Morphine.

Lead Salts.

1. **Emetic**: *Zinc sulphate* or mustard.
2. *Epsom salts* (magnesium sulphate), or *Glauber's salts* (sodium sulphate).
3. If colic or collapse, hot bottles or fomentations.
4. Milk and white of egg.

Mercury Salts.

1. **Emetic**: *Zinc sulphate,* ipecacuanha, or mustard.
2. *Much white of egg.*
3. Milk; dilute starch paste.
4. A little sal volatile or brandy and water if necessary.

If egg is not available, give meat-water made from chopped fresh meat.

Methyl Sulphate.

If inhaled—

Inhale *ammonia.*

If spilled on clothes—

Change and bathe *immediately.*

Morphine (Opium; Laudanum).

1. Give warm dilute potassium permanganate solution, about 0·25 per cent. strength.
2. **Emetic** promptly.
3. Inhale ammonia.
4. Keep **roused** by shaking, etc.
5. Keep warm. Hot and cold douche to head.
6. *Artificial respiration* if necessary.

Nitre.

1. **Emetic.**
2. Plenty of water; starch paste or barley-water.
3. Hot bottles.

Nitrobenzene.

1. **Emetic**: Zinc sulphate.
2. Keep patient *roused.*
3. Stimulants and artificial respiration if necessary.

Nitrous Oxide.

1. As for Chloroform.
2. Inhalations of diluted *oxygen.*

Opium.

See Morphine.

Oxalic Acid and Oxalates.

1. **Emetic**: *Zinc sulphate;* mustard.
2. If acid taken: **Chalk-** or **lime-water** (*not* **soda or** potash).

Phenol.

See Acid, Carbolic.

Phosphorus.

1. **Emetic**: Zinc sulphate.
2. Give *much water* and *a little French turpentine* **(no other oil).**

The best emetic for phosphorus poisoning is 0·2 to 0·3 gm. of copper sulphate crystals in water.

Potash.

See Alkalies.

Prussic Acid (Hydrocyanic Acid; Cyanides).

1. **Great promptitude.**
2. **Give mixture of solutions of ferrous sulphate and sodium carbonate.***
3. **Emetic: Large doses,** *zinc sulphate* or mustard.
4. *Artificial respiration; inhale ammonia*
5. Body warm; cold douche to head.

Soda, Caustic.

See Alkalies.

Strychnine (Nux Vomica).

1. Give potassium permanganate solution, 0·25 per cent. (See Morphine.)
2. **Emetic**: Mustard or zinc sulphate.
3. Place in *darkened room;* **absolutely no noise.**
4. Artificial respiration if necessary; inhale amyl nitrite.

Obtain medical aid without delay.

Turpentine.

1. **Emetic.**
2. Plenty of water.
3. Hot bottles, etc.

Zinc Salts.

1. Give much water containing some *sodium carbonate.*
2. Eggs and milk.

Strong tea or tannin solution.

* Convenient quantities are: 50 c.c. each of $FeSO_4,7H_2O$, 50 gms. per litre, and $Na_2CO_3,10H_2O$, 50 gms. per litre.

ARTIFICIAL RESPIRATION

No time should be lost in applying artificial respiration when directed, or in any case of insensibility when breathing cannot be discerned.

Schäfer's Method.—To be used unless injuries—*e.g.*, to ribs—prevent :

1. Lay patient face downwards on floor with head turned to one side.
2. Kneel beside patient, facing towards his head.
3. Place hands on lower ribs of patient, with the thumbs nearly meeting in the small of the back.
4. Press *firmly*, but *not violently*, directly downwards upon the back and lower part of the chest, thus causing *expiration.*
5. Release pressure more rapidly, but without removing the hands, thus causing *inspiration.*
6. Repeat operations 4 and 5 twelve to fifteen times per minute.

Laborde's Method. — To be used when Schäfer's method is not applicable :

1. Lay patient on back or side and clear the mouth.
2. Seize tongue (using a handkerchief to prevent slipping), and depress lower jaw.
3. Pull tongue forward, and hold for two seconds.
4. Allow tongue to recede into mouth.
5. Repeat operations 3 and 4 twelve to fifteen times per minute.

Notes.

When artificial respiration is used it should be *maintained without intermission* until medical assistance is obtained; it has been known to prove successful after a lapse of over two hours.

When natural breathing commences, the artificial respiration must be regulated to correspond thereto.

Give no solid or liquid food or stimulant by the mouth while the patient is unconscious.

Steps should also be taken:

1. **To excite respiration,** by applying smelling salts or snuff to the nose, and flicking the chest with a damp towel.

2. **To aid circulation,** when breathing has recommenced, by wrapping the patient in blankets, etc., rubbing the limbs energetically (towards the heart), applying hot-water bottles or hot bricks to the feet, limbs, and body, and administering hot tea, coffee, or meat extract, if the patient can swallow.

FIRE

PRECAUTIONS AGAINST FIRE.

1. Keep buckets of *sand* as well as of *water* in an easily accessible place.

Efficient "chemical" fire extinguishers are on the market.

2. Keep at hand a large *blanket* for wrapping round a person's burning clothes.

3. All the usual precautions regarding the manipulation of highly inflammable substances should be strictly observed.

4. The staff in a large building should always be made familiar with the position and use of the fire-alarms, extinguishers, hydrants, and escapes, of the telephone, and of First-Aid appliances.

5. Each room should have affixed over the door brief and explicit directions for leaving in case of fire—*e.g.*,

SECOND FLOOR—ROOM 17.

IN CASE OF

FIRE,

DESCEND TO BASEMENT,

PASS THROUGH CYCLE STORE, AND LEAVE BY DOOR ON RIGHT.

IN CASE OF FIRE.

1. *Shout for assistance* if conflagration other than local.

2. Use *sand* or *extinguisher*

3. If liquids are on fire, use **sand only.**

4. If *sodium* or *potassium* is burning, or is liable to take fire, **dry sand** only must be used.

5. Otherwise, pour water *carefully* into the centre of the conflagration.

6. If clothes are burning, lay patient on the floor, burning part of clothes *upwards,* and extinguish flames by covering or wrapping with blanket. Treat for burns (p. 14).

ACCIDENTS WITH STRONG ACIDS AND ALKALIES

1. Strong acids or alkalies on the *skin,* see p. 13 ; in the *eye,* see p. 15.

2. Strong *acids* on *garments* — apply ammonium carbonate or ammonia solution at once.

3. Strong *alkalies* on *garments*—apply dilute acetic acid solution at once (alternatively, use lemon-juice). Wash with water, then neutralize remaining acid with ammonium carbonate.

4. Strong *acids* on *bench, floor, etc.*—throw on handfuls of chalk or lime.

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