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MERCUROCHROME

H. W. & D.

IN FIRST AID



Hynson, Westcott & Dunning, Inc.
Baltimore, Md.

MERCUROCHROME, H. W. & D.

THE story of Mercurochrome begins in 1889 with the discovery of a red dye, phenolsulphonphthalein, by Professor Ira Remsen, of the Johns Hopkins University. Dr. L. G. Rowntree, working under Professor J. J. Abel, found that phenolsulphonphthalein is eliminated from the body almost entirely through the kidneys. The clinical application of this observation by Dr. Rowntree led to the introduction of the Rowntree-Geraghty kidney functional test.

The phenolsulphonphthalein used in this work had been prepared by Dr. H. A. B. Dunning, of Hynson, Westcott & Dunning, who originated the first commercial process for its production, and the firm later made the dye generally available. At that time there was no good urinary antiseptic, but since phenolsulphonphthalein is excreted through the urinary tract, Dr. Geraghty suggested the introduction of a metallic radical into the dye molecule as a problem worthy of investigation. A compound of this nature, a mercury derivative of phenolsulphonphthalein, was synthesized by Dr. Dunning and investigated by Drs. Hugh H. Young and E. G. Davis, who published a very favorable report. The problem was later taken over by Dr. E. C. White, who was working under Dr. Hugh H. Young, in the Brady Urological Institute of the Johns Hopkins University. Dr. White, in 1919, prepared a related compound, a mercury derivative of dibromresorcinnphthalein. This compound, the insoluble form of Mercurochrome, gave evidence of greater practical value than the original compound investigated by Drs. Young and Davis. The process for manufacturing the water-soluble green scales of commerce, from which the two per cent solution in water is prepared, was devised by Dr. Dunning.

While Mercurochrome is now widely used as a general antiseptic by physicians and is employed throughout the world in the first aid care of wounds, it was originally introduced to the medical profession as a urinary antiseptic. Its use in this way led to a more general application in cases in which an antiseptic was required. Mercurochrome thus came gradually to the attention of the laity and is now perhaps the best known and most widely used antiseptic in the world.

WHY THIS BOOK WAS WRITTEN FOR YOU

Many a man will remember to his dying day the misery of having to stand by the side of an injured friend, and of not knowing what should be done to take care of him until the help of a doctor could be obtained. That feeling of helplessness is something which is not quickly forgotten. On the other hand, there is no satisfaction so great as that of being able to do the right thing at the right time and, maybe, of helping to save a human life.

Excellent books on various kinds of first aid work have already been freely distributed, thanks to such progressive organizations as The National Electric Light Association, The American Gas Association, The National Safety Council, the United States Bureau of Mines, and many others. These books tell how to handle cases of electric shock, gas poisoning and drowning, and how to apply bandages and splints. We feel, however, that there is still need for another book—one that will tell, in a practical way, how to guard the injured against infection. There are many

cases on record where the infection of even a scratch or a small cut has caused this minor injury to become a serious one, or has cost the victim his life.

This booklet was not written by me. It represents the combined experience and judgment of the safety directors and other safety workers of a number of important industrial and public utility corporations. They have told you what to do and why it should be done, in the same plain, simple language which they would use when instructing the workmen in their own organizations. Their ideas have been checked and verified by physicians and scientists, who have found these ideas to be correct and expressed with all necessary accuracy, even though the plain, everyday English which they have used is **not always** the language of the clinic or laboratory.

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WHAT IS INFECTION?

As far back as human records run, it has been known that there was some unseen influence which when the skin was cut, torn or burned, caused many serious complications in the healing of a wound; wounds festered; gangrene set in; "proud flesh" occurred. Nobody knew why these things happened, but people quickly came to know the danger and the suffering which they caused. In an effort to escape this danger and suffering, wounds were burned with red-hot irons, and the stumps of amputated arms and legs were plunged into boiling oil. This treatment caused suffering enough of itself, but many people submitted to it willingly because it seemed to guard against the greater suffering and danger arising from the unseen influence which we now call infection.

In those days, also, cities and even whole countries were swept by "plagues." The Black Death, which wiped out such a large part of the population in London, England, in the years 1348 and 1349, was one of these. People died in such numbers, and there were so many sick, that it was almost impossible to bury the dead. Even today, many of us can recall that such diseases as typhoid fever, smallpox and diphtheria swept through a town or a city, carrying suffering and death with them. Until a comparatively recent

time, nobody knew just why these things occurred, or what could be done to avoid them.

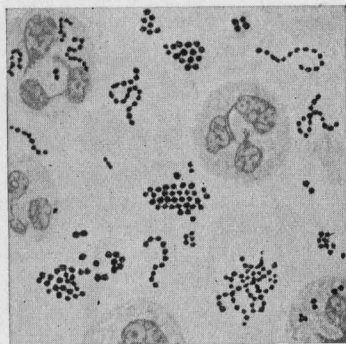
MICROBES

Today we know. We know that wherever we go, and whatever we do, we are surrounded by uncountable millions of tiny creatures, so small that they cannot be seen by the naked eye, but capable of doing a tremendous amount of damage, because there are so many of them. These little creatures are known by a number of different names, such as germs, bacteria, etc., but for present purposes we will refer to them all as microbes. We will not stop to consider the many good services performed by certain kinds of microbes, nor the way in which others work to spread sickness. We will just consider briefly the way in which certain kinds of microbes sometimes cause the condition known as infection when the human body is injured in any way.

First of all, let us repeat that microbes are everywhere. They are all over the surface and inside our bodies. Microbes do not live very long, but they can produce unbelievably large families in a short space of time.

Microbes are hearty eaters, considering their small size. Those which inhabit the human body are likely to feed on any dead, worn-out or weakened body tissues that they

can find. They are not so liable to feed on strong, healthy body tissues, because these tissues can and do resist them. The fact remains, though, that many microbes produce poisonous substances, which may weaken and



Appearance of microbes when placed under the microscope and magnified 1000 times. Each black dot represents one complete creature. Under favorable conditions a single microbe may in one day increase in number to as many as 15,000,000,000,000 (fifteen trillions).

Note: We are indebted to the Oxford University Press for permission to use this picture.

destroy even strong, healthy body tissues. The production of these poisonous substances in dangerous quantities becomes easy enough, if sufficient microbes are allowed to get together and to feed and multiply. And, as

healthy tissue is destroyed or weakened by these poisons, there are more and more opportunities for the microbes to feed and multiply.

INFECTION WITH MICROBES

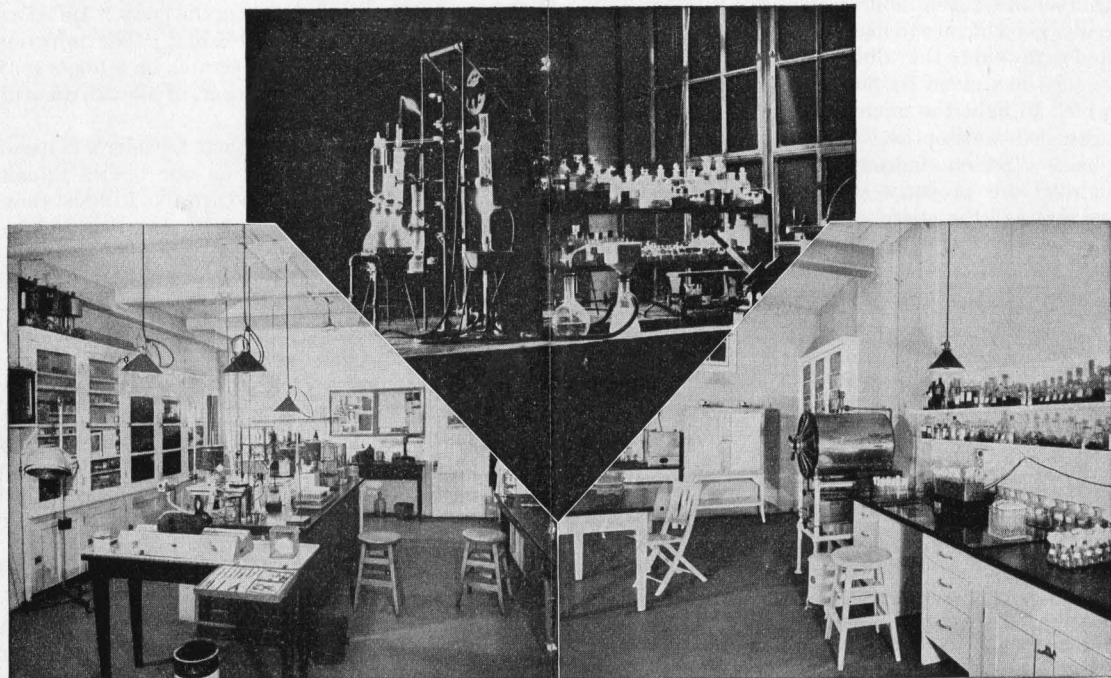
Now, let us consider what may happen when a man receives a slight scratch on his finger. The skin is opened, and the body tissues and smaller blood vessels underneath it are torn and exposed. Dead and weakened body tissues and clotted blood furnish a good starting place for a colony of microbes. There is room for millions of them in a scratch a quarter of an inch long. The microbes will be on the job. They will at once begin to feed and "breed" and to produce their poisons.

Often the natural forces of defense in the healthy human body can overcome the microbes, but we never can be sure that this is going to happen, and the microbes may be the winners in the contest. They may multiply so rapidly that the healthy tissues around the wound become poisoned and inflamed, and die, thus giving the microbes a still better chance to increase in numbers. They may continue to take advantage of this condition, and widen their field of action, until presently there is so much toxin, or "poison," and so many microbes being poured into the blood

stream, that the blood can no longer do its regular work of cleansing the body. Infection has set in and is spreading. The infection that started around a scratch on a finger may cause the loss of the finger, of a hand, an arm, or a life.

We mentioned that there are microbes inside our bodies. As long as our bodies remain reasonably healthy, and are able to resist these little creatures, they do no noticeable harm, but they are always ready to take advantage of any opportunity that may arise. This is why even a bad bruise may sometimes become infected. The blow which causes the bruise may not break the skin, but it breaks small blood vessels and weakens the body tissue under the skin, with the result that the microbes may have a chance to make a successful attack unless proper care is taken to hold them back. Anyone who has suffered from an abscessed tooth will know what can be done by microbes working inside the body.

It may reasonably be asked how the human race can continue to exist under conditions such as we have described, but we believe we have already laid the foundation for an answer to this question. Microbes are powerless to harm the human body as long as it remains in a healthy, vigorous condition. In the old days, when the body, or any part of it, became weakened as a result of a wound, or even



LABORATORIES IN WHICH MERCUROCHROME IS STANDARDISED

Corner of Chemical Laboratory

Pharmacological Laboratory

Bacteriological Laboratory

through such causes as fatigue, exposure to cold, or insufficient nourishment, the microbes had a good chance to make a successful attack, and many times they did. Nowadays, though, science has given us powerful weapons with which to fight the microbes. These weapons are called "antiseptics," which in plain English means "poison fighters." If these poison fighters are properly—and promptly—used, we may kill the microbes before the microbes have a chance to start to kill the man.

FIGHTING MICROBES WITH MERCUROCHROME

Men have used many different kinds of weapons in their battles with microbes, sometimes successfully and sometimes without success. In the old days, before people knew what microbes were, they used certain things without really knowing why. People probably began to use red-hot irons and boiling oil because they felt that they deserved a cure as a reward for submitting to anything so painful. Even today, many people favor unpleasant medicines because they feel that they must then be getting some real, effective action. It is, however, no longer necessary for people to do things without knowing the reason. Microbes have been studied, and so have the agents that might be used in fighting

them. Some substances have been found, by actual test, to be useful under certain conditions, or in fighting certain types of microbes. Others have been found to be valuable in more general ways. Doctors can employ them with assurance because it is known in advance what may be expected of them.

In every first aid kit there must be some substance that can be used to help the body in fighting microbes. This must be a good, general-purpose antiseptic, capable of giving proper service under the greatest possible variety of conditions. Anything which changes or deteriorates with age is not reliable. An antiseptic that is poisonous is of little value when, as often happens, an injury of the mouth or throat must be taken care of. Such substances may be applied by doctors who are skillful in their use and who know their dangers, but they are not proper material for use in first aid work. The proper antiseptic for first aid must be effective, safe and of reasonably low toxicity.

WHY MERCUROCHROME IS EFFECTIVE

Careful tests and the experience of thirteen years have shown that Mercurochrome meets these requirements. A solution of two parts of Mercurochrome in 100 parts of water is strong enough to answer all ordinary require-

ments for the protection of wounds against the action of microbes. On the other hand, a considerable quantity of the solution has been swallowed without causing any serious harm. A solution of Mercurochrome in water may be applied to burned surfaces, to badly torn wounds, or to the most delicate parts of the body, without causing pain. It may even be introduced into the eye. It has been found, by actual test, that Mercurochrome solutions which have been kept for five or six years are equally as good as freshly made solutions. Evaporation does no harm to a Mercurochrome solution, because a large part of the water in which the Mercurochrome is dissolved can evaporate and still leave a solution that will be entirely satisfactory for use. Mercurochrome solutions that have been frozen will be just as good as ever when remelted by the application of gentle heat.

These are the reasons why we recommend Mercurochrome for use in first aid work. Its toxicity is so low that anyone can use it freely, on any part of the body, and as frequently as may be desired. The red stain made by Mercurochrome shows just where it has been placed.

FIRST AID FOR DIRTY WOUNDS

All wounds should be promptly cleansed of dirt. If there is no grease mixed with the

dirt, only soap and water will be needed. In locations such as machine shops, where men are likely to get grease or oil on themselves, it is advisable to have for cleansing purposes a small bottle of gasoline (not the "high test" kind or "Ethyl gas" which contains lead compounds) or coal oil, or some such fluid which will cut the grease or oil around the wound. This will help the Mercurochrome to establish a closer contact with the wounded parts. If there is grease in and around the wound, and this grease cannot be removed with soap and water, first flood or mop the wound with Mercurochrome; then sponge it with one of these fluids to cut the grease; finally soak the wound once more with Mercurochrome and cover with a clean bandage.

Another good idea is to keep in the machine shop or garage a 5 per cent solution of Mercurochrome dissolved in equal parts of alcohol and water. Such a solution, while irritating, is more effective in penetrating a greasy layer.

METHOD OF APPLYING MERCUROCHROME

When solutions in small glass tubes are used, be careful to keep particles of glass out of the wound. Do not hesitate to apply the Mercurochrome freely. No harm will result from using a lot of it, but, if too little is used,

the microbes may not be attacked vigorously enough or may escape action of the solution entirely. The wound, or whatever injury is being treated, should receive a good flooding of Mercurochrome. It does not hurt or sting when applied and everyone should be cautioned to apply the solution to every portion of a wound. When a toe or finger is injured, the affected part may be soaked in the solution for five minutes, or longer, if it is thought advisable. If gauze is used, put on as many applications of Mercurochrome as desired and bandage immediately. Just to play safe, a second application should be made the day after the first treatment, even though there is no inflammation or other sign of infection.

WHEN TO USE MERCUROCHROME

Mercurochrome should be used as first aid in every type of wound as a prophylactic measure, *but medical advice should be obtained as promptly as possible*. The solution should be applied even in small clean cuts, cuts or scratches where oil or grease is present, deep wounds from nails, etc., wounds from splinters or slivers, and crushed or mangled wounds. The solution should be used freely and the injured part bandaged at once. Excepting in the case of slight and shallow wounds, the injured party should be taken to a doctor or a hospital as quickly as possible, because it is

often necessary to have some competent person open up the wound and make sure that the antiseptic has penetrated clear to the bottom. This is particularly important in cases where slivers or splinters have worked in under the skin, or in the case of pierced or perforated wounds such as stabs, gunshot or foot injuries caused by stepping on nails. Blisters on the foot, on account of the location and the opportunity for re-infection, should have special attention from a doctor. It should also be remembered that the physician is the only person who is qualified to decide whether or not tetanus antitoxin should be given.

Mercurochrome is always useful as a safety measure in cases of compound bone fracture, where the skin has become perforated, and in gunshot wounds. Mercurochrome should be applied to all the various types of burns which frequently occur. Live steam burns, scalds where the skin is peeling off, and burns from acid, creosote and other chemicals may be treated in this way. Boils and other infections, and insect bites, should receive applications of Mercurochrome.

The solution may be safely used in injuries of the eye and mouth and should be applied in various scalp injuries. *The solution in alcohol should not be used in the eye.*

Mercurochrome solution should be used

freely. Do not be content with one application at the time of injury, but continue to use the solution until the condition has cleared up.

FIRST AID KITS, ETC.

The best way to carry Mercurochrome in portable first aid kits is in small applicator bottles, in little sealed glass tubes, or ampules, or as "Mercurochrome Swabs." Each ampule or swab contains enough Mercurochrome for the first aid care of an ordinary small wound, while the contents of as many ampules or swabs as may be necessary should be used on larger wounds. In permanent first aid stations, the solution will, of course, be carried in bottles of convenient size. There are also several makes of adhesive bandages which are very handy for use in protecting small scratches and cuts and, at the same time, giving them the benefit of Mercurochrome treatment. They can be placed over the wound and then soaked with water, which will dissolve the Mercurochrome in the gauze and allow it to enter the wound. It should be remembered, though, that practically all manufacturers of first aid kits can supply solutions of Mercurochrome in glycerin or other non-freezing substances.

This booklet has been written in order that you may know what to do before the doctor arrives. Remember that even the most competent first aid worker is not justified in assuming the responsibilities that rightfully belong to a physician.



This seal denotes acceptance of Mercurochrome for New and Nonofficial Remedies by the Council on Pharmacy and Chemistry of the American Medical Association.