"THE *Acti-Zyme* STORY"

This story summarizes one of the world's most interesting and amazing modern scientific discoveries—**ENZYMES**—a cure for one of civilization's oldest problems; the problem of sewage disposal.

What Are Enzymes?

Enzymes are best described as organic catalysts. In pure form, enzymes are crystalline in structure. Each enzyme is specific in its reaction, i.e., fat splitting enzymes will not split proteins, nor will protein splitting enzymes split fat. This causes a wide difference in the rate of digestion of different types of sewage. The starches and proteins digest much more rapidly than the fats and greases.

No Sewage Digestion Can Take Place Without The Presence of Enzymes

Bacteria cannot assimilate solid food because they have no digestive tract through which food can enter. In sewage digestion, the solids surrounding the bacteria are split into liquids by the action of enzymes; the resulting **solution diffusing through the outer skin** of the bacteria is digested throughout the interior cytoplasm.

With these conditions in mind, many experiments were carried out to determine the correct balance of enzyme active material to bring about, as nearly as possible, an even digestion of the starch, protein and fat in normal sewage. Multiple enzymes of specific activity desirable for sewage treatment were finally formulated into the "ACTI-ZYME" product, making it suitable for use by industry, municipalities and private home owners.

What Acti-Zyme Does

Acti-Zyme is an enzyme active biological compound especially formulated to increase the rate of digestion of sewage.

It will alleviate sewage disposal troubles; it will eliminate the need to manually clean grease traps and pump septic tanks; it will open up drain fields.

It not only will clear up emergency troubles but it will prevent these troubles from occurring.

Cost of "Acti-Zyme"

Acti-Zyme prevents sewage troubles. Prevention is more economical than costly corrective measures. Actually, the use of Acti-Zyme does not entail any cost at all since it invariably saves its purchase price by eliminating many expensive conditions that arise through improper digestion in a disposal unit. The cost is definitely only a fraction of the other known solutions. This is particularly true when you realize that it will continue to keep the system working properly and thus avoid all future pumping and/or construction of additional facilities. As regards to commercial places such as hotels, motels, restaurants, etc., any temporary sewage difficulties of only 24 hours could result in a loss of business of hundreds of dollars. It should therefore be used wherever possible as a **preventive** measure. Why wait for trouble to occur?

Successful Treatment

When the enzymes and bacteria of a system are insufficient and they almost always are, the system starts to fail because some of the solids or greases are not digested. They then are pushed through the system and tanks and lines become clogged.

All modern sewage disposal systems operate on the same basic principal. It makes no difference whether it be a large city sewage plant or the smallest home installation. Essentially solids, greases and liquids pass through the system. The greases float and are physically removed or are 'digested' on the surface. The solids are attacked by enzymes which "liquify" them. The liquid is then dispersed into the ground by cesspools and/or leach lines (drain fields) or by physically removing the liquids by pumping out to sea, or utilizing the liquid in irrigation projects for agriculture.

The Average Sewage System Is Made Up of Three Basic Parts

1. The sewer lines, including greasetraps.
2. The septic tank.
3. The cesspool and/or drain fields.

The sewer lines carry the sewage from the point of entry to the septic tank or the place of digestion. Grease is the most difficult product to digest in the system, therefore greasetraps are often put in the sewer lines to remove the grease before it enters the septic tank.

The grease trap is a tank or box through which the sewage must flow. In the trap are baffles which skim off the grease, permitting the water and heavier solids to flow under the baffle into the lines. The entrapped grease is then removed manually as it accumulates.

The septic tank is a steel or concrete tank, the size of which depends upon the volume of influent from the sewer lines. This tank slows the velocity of the sewage permitting the solids and the grease

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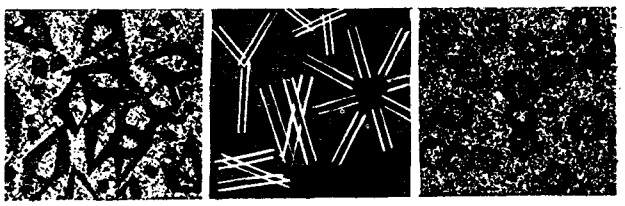
to separate from the liquids. In the septic tank the enzymes go to work to liquefy the solids. The liquids pass on out into the cesspool and/or leach lines and are absorbed into the ground.



ENZYME CRYSTALS

The leach lines usually consist of loosely laid pipes which permit drainage of the liquids to a large area of ground so that they may be readily absorbed by the earth. A cesspool is a dry well and is sometimes used in place of a septic tank and leach field. More often it is used in conjunction with them.

Practically the only remedies for sewage troubles **up to this time** has been either pumping of the system or construction of new facilities. The three main causes of a poorly operating system are:

1. Insufficient bacterial action to accomplish digestion.
2. The use of too much caustics, acids, detergents, etc., which kill bacteria and stop digestion.
3. Improper design and construction of the system.

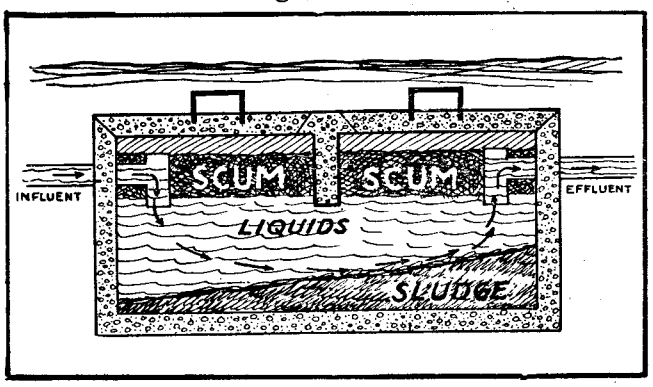
If there is a grease trap in the system which is inadequate to trap excess grease, this will increase the trouble, for the excess undigested grease flowing into the lines will soon seal the system so that no drainage can be had.

Treatment of Home Septic Tanks

Septic tanks are designed to give a satisfactory disposal unit for the home and do not have provision for removal of sludge without pumping. For many years, the firms that were equipped to pump the sludge out of the resident septic tank, did so for a very reasonable fee. Since World War II, a great many newcomers who have entered this field of business, merely pump out the liquids, leaving all or nearly all of the digested sludge in the bottom of the tank, necessitating a fairly quick return visit for another pumping. This of course does not mean that the majority of pumping services are unscrupulous. Many things contribute to the need for pumping, such as the use of detergents, caustics, etc., which have added considerably to our present day sewage problems. **"ACTI-ZYME"** will relieve the situation, without pumping, by giving complete digestion of all accumulated solids. **ACTI-ZYME WILL SEED AND REGENERATE THE NATURAL ENZYME AND BACTERIAL ACTION IN SEWAGE SYSTEMS.**

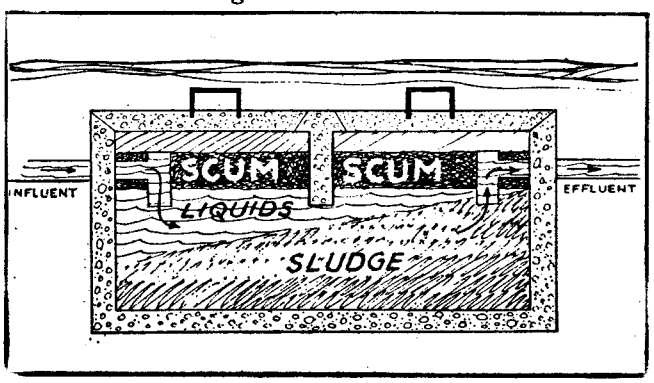
The following illustrative sketches show the reaction of septic tanks under varying conditions as exist in septic tanks.

Diagram No. 1



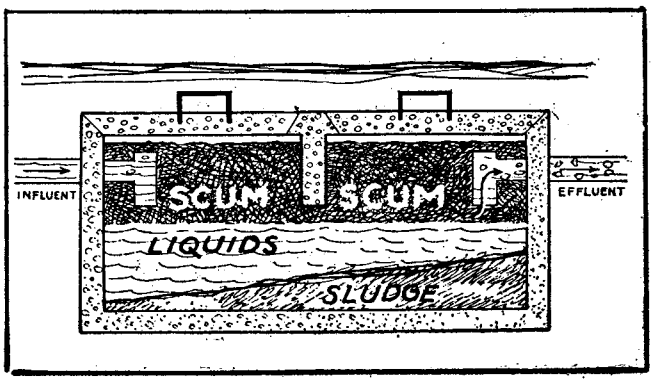
Sketch Number One shows a normally operating septic tank under proper design prior to accumulation of digested sludge in the amount that would require cleaning.

Diagram Sketch No. 2



Sketch Number Two shows a tank where sludge accumulation has reached a point where solids are being flushed into the drain field. The solids will soon clog the drain field and the toilet will be slow to flush or overflow upon flushing.

Diagram Sketch No. 3



Sketch Number Three shows a heavy scum layer, often caused by the introduction of large quantities of cooking fats, or yeast. In this case, either regular treatment with **ACTI-ZYME** or the installation of an efficient grease trap in the line is required. If a grease trap is installed, regular cleaning of the trap must be maintained.

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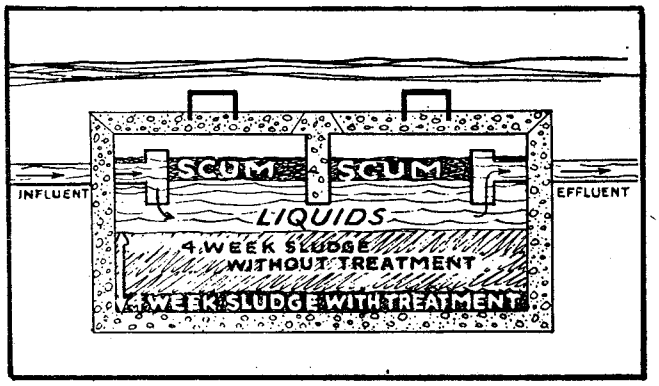
Diagram Sketch No. 4



Sketch Number Four is used to show the difference in sludge accumulation with and without treatment in an already operating tank. It should be noted here, as it is important upon the effect in the drain field, that the enzymes are water soluable and therefore are gradually flushed into the drain field where further benefits are derived.

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Cases of extreme trouble will be indicated by a strong odor or backing-up of sewage in the drain lines. An indication of trouble can be determined by opening the septic tank and running a stick to the bottom — the amount of accumulated solids on the bottom of the tank plus the thickness of the grease mat which floats on the top of the tank, should never be in excess of one-third of the tank's total depth.

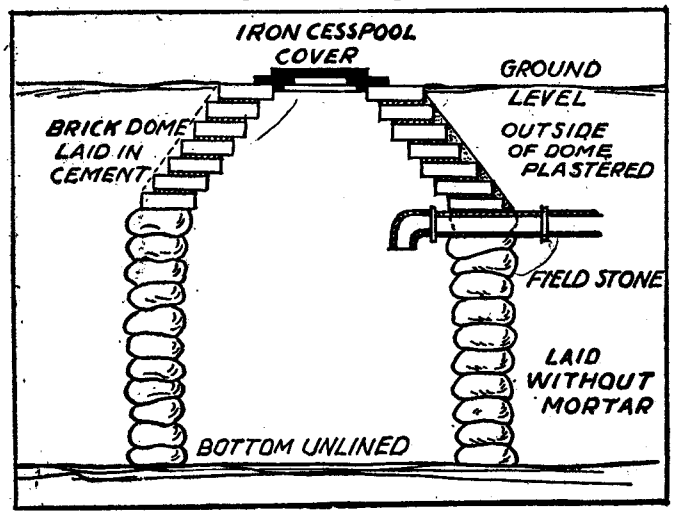
To give rapid and immediate relief in emergency cases, place one to two pounds of **ACTI-ZYME**, depending on the size of the tank, in a paper bag along with a stone of sufficient size to carry the bag to the bottom. Now poke a hole in the grease mat and drop the bag into the bottom of the tank. Treatment should then be continued through the drain in the building in accordance with the instructions on the can, except that for the first 30 days, three times the prescribed amount of **ACTI-ZYME** should be used. In cases where it is not practical to open the septic tank, the charge can be added through a toilet bowl. This treatment will accomplish the following:

1. Complete odor control within two to 10 days.
2. Reduction of sludge and breaking up of grease mat within 10 to 14 days.
3. Cleaning of sewer lines within 48 hours.
4. Opening up of leach field to permit drainage of effluent within 30 to 60 days.

Treatment of Cesspools and Drain Fields

A cesspool is primarily used to disseminate the effluent liquids after they are passed from the septic

Diagram of cesspool



tanks. Where there is no septic tank the treatment for the cesspool is identical to that of the treatment for septic tanks.

In the most common system, the porous cesspool which is constructed much like the diagram, and the drain lines or leach field are used to get rid of the liquids by allowing the liquids to trickle into the ground. In a clogged system, the drain lines and the cesspool will be sealed by grease and undigested solids, preventing release of the liquid into the ground. Thus when additional sewage is added to the lines, there will be a back-up or over-flow someplace.

To treat the cesspool which is clogged and to relieve congestion of drain lines, introduce an appropiate quantity of **ACTI-ZYME** to the bottom of the cesspool. This will start the action of liquifying the solids and grease causing the clog. The enzymes will eventually pass out to the drain lines where their action will continue. It usually takes from 30 to 60 days to unclog a system where even the drain lines are clogged.

One important thing to remember is that the enzymes require movement of the sewage in order to do their work. Therefore, if a system is completely clogged so that there is no flow, steps should be taken to obtain movement. This can be done by either digging temporary drainage holes at the end of each drain line, so that at least some effluent will be passing through the lines. Or in the alternative, the cesspool should be pumped to make room for additional flow.

Treatment of Imhoff Tanks

The Imhoff tank is a variation of the septic tank and differs principally in that the tank is divided into three compartments. The upper compartment is so designed to allow the raw sewage to flow slow-

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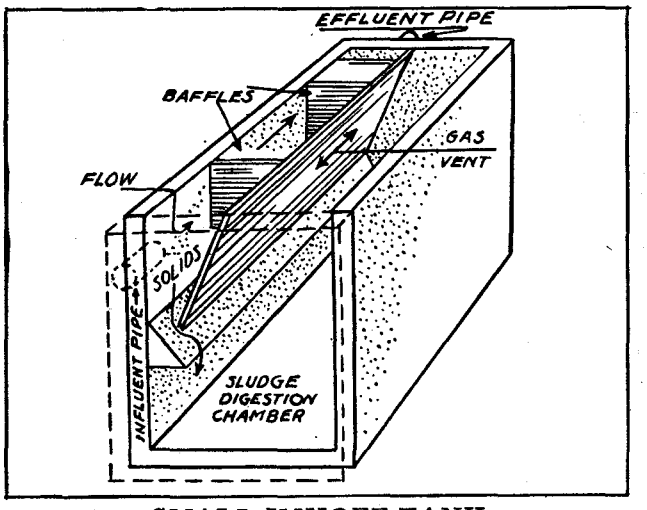

SMALL IMHOFF TANK

ly through it, which allows the solids to settle into a second compartment which acts as the digestion chamber. In this compartment anearobic bacterial decomposition takes place and gases carry scum to the surface of the third chamber. One of the chief causes of the unpopularity of the Imhoff tank is foaming in the gas or scum compartment. (See sketch). Foaming is caused by excessive loading of raw solids in relation to digesting solids in the tank or increased activity in the digestion chamber causing rapid formation of the gas. This frequently takes place in the spring due to slow digestion during the winter months which allow accumulation of raw solids in the digestion chamber.

Treatment with **ACTI-ZYME** will reduce scum formation tremendously, stabilize the pH and give rapid and even sludge digestion.

Treatment of Grease Traps

Grease traps are frequently neglected because of the extremely unpleasant job of cleaning and maintaining them. One of the improper methods frequently used for cleaning clogged grease lines is to add caustics. This is **BAD** because, although it will give temporary relief, it will **kill the bacterial action** besides causing damage to the plumbing. Grease and caustics are the combination which form hard soap. It will therefore readily be understood why caustics eventually add to clogging troubles.

ACTI-ZYME will liquefy grease and clean grease traps without manual labor. In cases where traps have been neglected and are in bad shape, with pollution and odor, it is advisable to open the trap and introduce (mixed in a bucket with warm water) from one cup to one pound of **ACTI-ZYME** directly to the trap. This will correct the trouble within three to four days. Constant daily applications, thereafter, of small quantities will eliminate odor and the future need for manual cleaning. Where a grease problem exists, a daily treatment is vital.

There is a Need for Acti-Zyme At All Levels

Private Homes: **ACTI-ZYME** should be used by **ALL** households when operating on a septic tank sewage system as an insurance against the inconvenience and expense of probable future trouble. It's far cheaper to prevent trouble!

Commercial Establishments: Hotels, motels, trailer courts, restaurants, clubs or eating places where more than normal quantities of grease pass through the kitchen line will find **ACTI-ZYME** a solution to all their current problems of disposal. It will give them clear running lines and traps at all times and will eliminate that offensive odor.

Industrial & City Sewage Plants: Canneries, military bases, institutions, schools and large city sewage installations have all used **ACTI-ZYME,** proving the success of this treatment from the smallest private home system to the large city plant.

IF YOU INSURE YOUR CAR AGAINST ACCIDENTS—

IF YOU INSURE YOUR HOUSE AGAINST FIRE—

WHY NOT INSURE YOUR SEWAGE SYSTEM AGAINST FAILURES?

Acti-Zyme Distributors