

# The Worm and You

Everyone knows that worms are good for fishing and scaring little girls. But what is the value of these wriggling organisms to an industrious, hardworking, efficient businessman? What possible value do they have for the president of a corporation or the laborer on the job? Did somebody make a mistake? Did these questionable creatures worm their way in when God wasn't looking? Here are the facts about these wiggly, wiry, wonderful worms!

by Leslie L. McCullough

"YOU WORM," berates the caustic wife to her bumbling dolt of a husband.

"WORMS" proclaim crudely lettered signs on the approaches to hundreds of fishing spots across the United States.

"UGH! WORMS," gasp little girls everywhere as they flee in feigned terror from the squiggly little creature grasped between the thumb and forefinger of the neighborhood boys. Thanks to television, millions are more acutely aware of the possibilities, at least of the word, for describing their spineless, TV variety of husband.

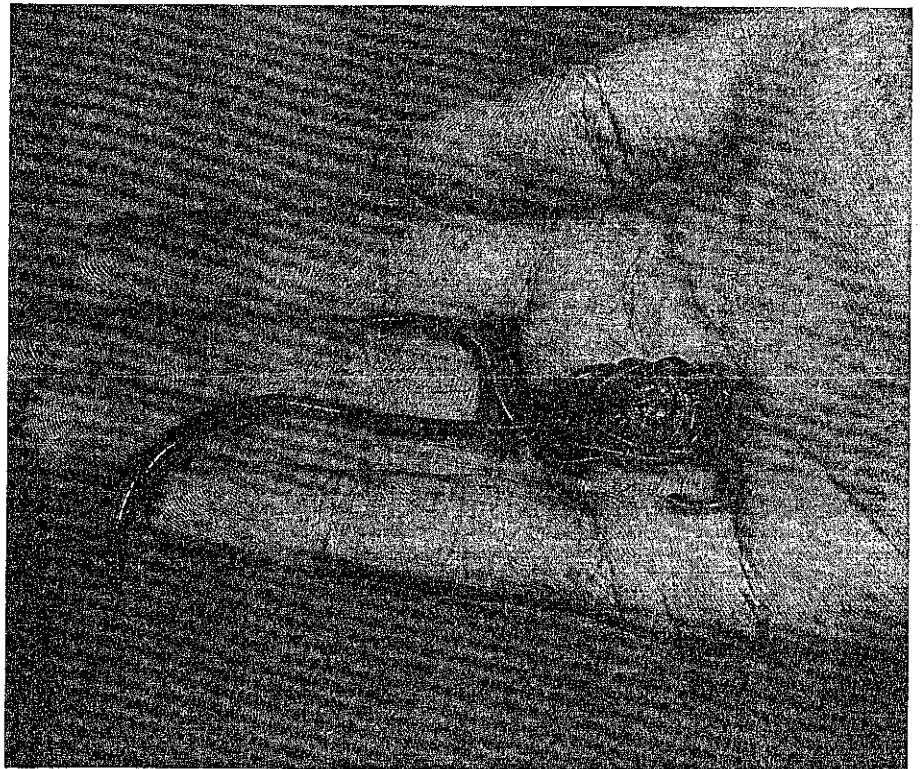
But are there any uses other than the time-honored, indolent, fun-loving ones with which we are too familiar?

What about you? Can you think of one single benefit you might derive from a three- to four-inch segment of protoplasm burrowing in the earth beneath your feet? Is there any real value or purpose to be found for these creatures?

YES! As with everything God created, there is a purpose — an important purpose — for the Oligocheata, or order of the earthworm. He is a valuable asset to you whether you are an amateur horticulturist, backyard gardener or full-fledged farmer. He is equally as valuable to the consumer who has never seen a farm or been beyond the confines of his particular city.

## Disease Fighter

The doctor in his immaculate white gown and surgical mask is a familiar figure to most people. The sign of his staff or black bag is readily recognized



Wells — Ambassador College

Earthworms added to a garden plot are valuable assets in producing a good crop.

worldwide as being synonymous with health and disease fighting. But you probably don't realize the lowly earthworm has a similar responsibility.

How can an earthworm fight disease? The simplest way possible — he *eats* the pathogenic or disease-causing microbes. The microbes aren't his sole diet. Their demise is just *one of many* helpful side benefits derived from this voracious little friend of man.

In order to move through the earth, the earthworm must literally eat his way through the soil. Every particle of soil,

vegetable or animal matter he encounters must be pushed aside or eaten. The material is taken into the worm's mouth where it is mixed with saliva, passed on to a gizzard-like organ where it is ground, then on to the intestines to be digested and finally excreted.

The digestive process of the intestines has been found to kill many of the harmful microbes found in the soil. Soil microbiologists have discovered that disease type fungal mycelia develop more abundantly in temperate area soils where earthworms are scarce. Some

areas have even experimented by using earthworms to clean up land which was infested with soil pests. The earthworms were found to eradicate nematodes (trichina, roundworms) from a field in a short time.

Even more amazing is the fact that these same digestive processes are not harmful to the *useful* micro-organisms or bacteria-like actinomycetes which are *needed* in the soil. If it were not for these tiny particles of life, plant remains would not decay as readily, and the fertility of the soil would be impaired.

#### Nature's Plow

"The ole fishin' hole" and work seem to be opposite extremes of man's activities. Yet the bait so frequently used by small boys is just as effective, whether at the "fishin' hole" or on the job.

Like so many of the other creations of God, the worm just naturally applies the principles of Ecclesiastes 9:10, "Whatsoever thy hand findeth to do, do it with thy might." He isn't anticipating any rewards. He does just what comes naturally.

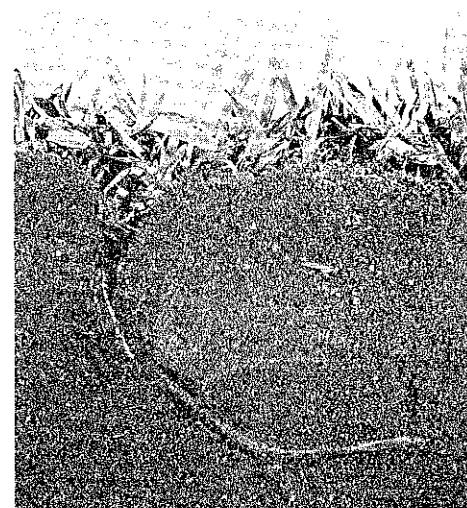
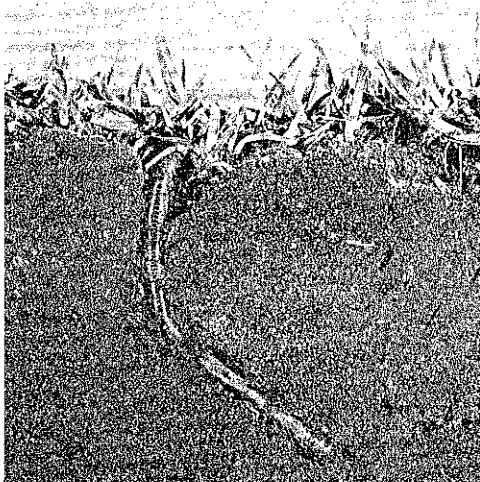
He works hard night and day to establish the labyrinth of tunnels from which he receives his food. This network of tunnels then provides a passageway for the rapid penetration of surface water to the roots of the plants during a rain.

When these tunnels are not in use by the worm for transit or piping moisture to the subsurface, they serve as air-conditioning ducts to help aerate the soil. Well-aerated soil promotes growth of *helpful* micro-organisms and algae which in turn help produce healthier crops.

You see, the earthworm isn't the only lowly laborer in the God-ordained way to keep soil rich and fertile. God has provided an intricate complex of helpers in the form of billions upon billions of microscopic creatures who help maintain the balance and fertility of the soil.

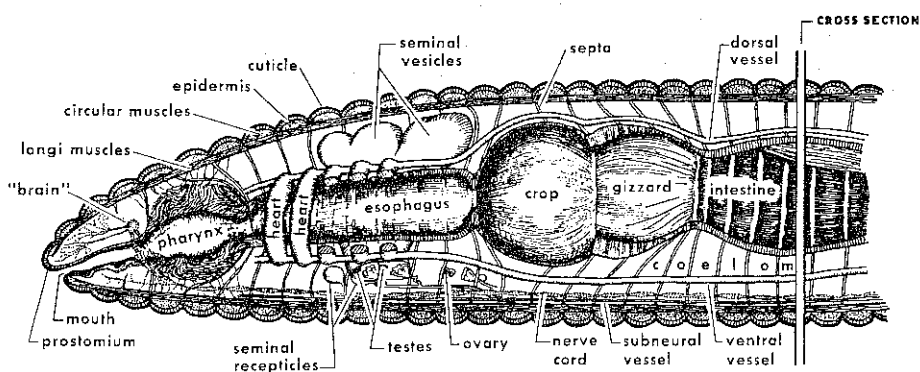
As usual, someone stands to profit from the work of others. In this case, the vegetation proves to be the beneficiary. These worm freeways provide easy access for root penetration deep into the subsoil and its hidden store of minerals.

At other times, this unseen cultivator



Duncan, Wells — Ambassador College

Progressive series showing how a burrowing earthworm aerates soil. Notice at the ground surface the castings left by the tunneling creature.



**MEDIAN SECTION**

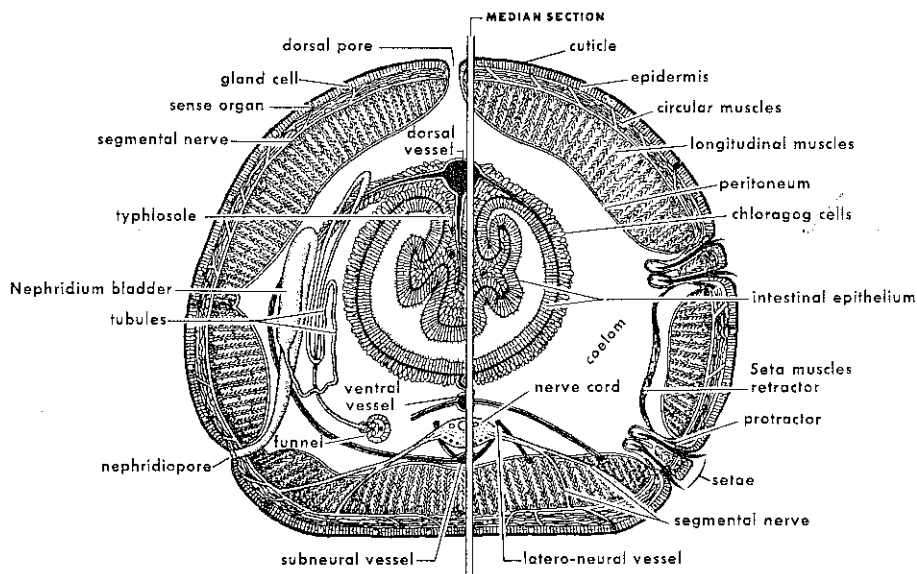
(EARTHWORM)

of the soil journeys deep into the sub-surface warehouse in search of food or simply to escape the cold. His trips will often take him six to eight feet below the surface. And again the vegetation profits. Minerals lying far below the reach of the root system are carried back to the surface where they become readily available for use by the plants.

**Fabulous Fertilizer Factory**

Even if you don't happen to have an especially "green thumb," you realize the need for soil nutrition. You may not think in terms of nutrition when it comes to the soil, but nevertheless, that is what is occurring when you add fertilizer to your yard, garden or plants.

In this day of vanishing food supplies and depleted soil, fertilizer has become an essential part of the economics of any developing country. Vast sums are spent in research to find new ways or new materials to be used to promote plant growth. Agriculturists eagerly embrace new ideas in their



**CROSS SECTION**

(EARTHWORM)

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attempts to coax more produce from the land.

The problems-facing the management of a modern fertilizer factory have produced untold ulcers. But our wriggling little fishing companion stomachs this dirty problem daily without so much as mild indigestion. This mobile factory-in-a-tube has no difficulty with waste disposal or pollutants, or for that matter with the problem of getting raw materials to the factory. He goes to the raw material rather than having it brought to him.

As he eats his way along, he solves the problem of pollutants by turning the wastes into *useful*, NEEDED by-products. The ingested materials undergo chemical changes, deodorization and neutralization. While in the intestine, the material is bathed in

urinary secretions which render it high in nitrogen. The material is then excreted in little mounds so familiar to the gardener or farmer and known as "castings."

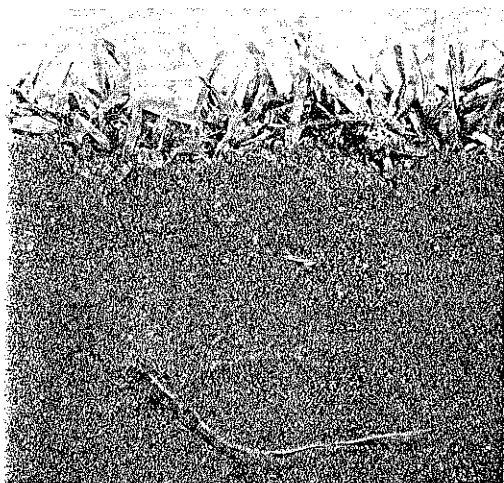
Mrs. Housewife or the corner grocer might feel these castings to be of little interest or value to them. Yet one of the first elements to be depleted from the soil by growing crops is *nitrogen*. It is essential for healthy, strength-giving produce which means more customers for the corner grocer or a healthier family for Mrs. Housewife.

The product of this super-efficient fertilizer factory is not only delivered right to the plant's doorstep, but it is also found to be immediately available in an easy, water-soluble form.

When the end result of this factory-in-a-tube was compared to surrounding topsoil, it was found to be: (1) five times as rich in nitrate nitrogen, (2) twice as rich in exchangeable calcium, (3) two and a half times as rich in exchangeable magnesium, (4) seven times as rich in available phosphorus, (5) eleven times as rich in exchangeable potassium as the surrounding soil. (See Barrett's *Harnessing the Earthworm*, ch. 13.)

**Soil Builder**

Being the executive and administrator that he is, the earthworm maintains a



careful watch over fellow laborers. Many of the organisms who aid the worm in the building and restoring of the soil cannot work efficiently where it either is too acidic or alkaline.

The digestive process of the worm neutralizes either of these two extremes so that the castings deposited in the soil provide the most beneficial working conditions possible. Soil scientists have discovered that the soil's content of actinomycetes — organisms which play a significant role in decomposing organic matter into humus — multiplies seven times as it passes through the earthworm.

In addition, the earthworm frequently helps feed his companions by pulling bits of animal or vegetable matter into his tunnel. There he and his friends are free to devour the material which ultimately adds to the humus so badly needed in the soil.

Studies show that each mature earthworm is capable of casting up nearly one-half pound of humus each year. Under normal conditions, this means TWELVE AND ONE-HALF TONS of top-soil *per acre* are added each year thanks to the efforts of the earthworm.

Is it any wonder that Charles Darwin claimed the earthworm was the "barometer of soil fertility"? Or that after fifty years of study he concluded that without the earthworm the vegetation in many areas of the world would degenerate finally to the *vanishing point*?

#### What Can You Do?

You — the housewife, homeowner, gardener or farmer — can benefit from better soil. It makes your lawn and flowers look better. It gives you stronger, healthier plants which will result in stronger, healthier people.

You can encourage the growth of earthworms around your home by making conditions more favorable for them. The homeowner can turn grass clippings and leaves into the top few inches of his garden.

The farmer can, by the simple expediency of adding manure to his soil, increase the earthworm population immensely. In one study, this simple method increased the earthworm popu-

lation from 13,000 to over 1,000,000 per acre in a relatively short period of time.

In the dry areas of the world, the transformation of this trash into humus will greatly enhance the moisture-holding capacity of the soil. When the soil becomes too dry, the earthworm withdraws deeper into the soil. There he becomes dormant until conditions are favorable once more.

During a cold snap, the worm must go deep into the soil to prevent freezing. If the frostline penetrates downward more rapidly than the worm can burrow, the frost will catch him and put an end to his activities. Oftentimes tilling plant residue into the top few inches of soil will slow the frost penetration and enable the worm to descend below the frostline. He remains dormant there until spring.

Then when conditions are right, he returns to the surface to carry on his silent but feverish activity in the top six inches of your soil.

#### What Have We Proven?

Fertile, disease-free soil is not just *important*, IT IS VITAL for the health and well-being of everyone — the business executive, housewife, and laborer, as well as the farmer. With the world facing the most severe food shortage it has ever seen, the needless loss of soil fertility is criminal.

Of course, earthworms are not a panacea for the world's ills. Just adding worms and stirring isn't going to produce fertile, productive soil overnight. IT TAKES FAR MORE THAN THAT! It requires an understanding of God's laws to properly use this earth. It calls for obedience to those laws for man to be *happy and healthy*.

The Director-General of the United Nations Food and Agriculture Organization, Binay Sen, said: "Either we take the fullest measures both *to raise productivity* and stabilize population growth, or we face a disaster of UNPRECEDENTED MAGNITUDE . . . Problems of *hunger and malnutrition* which afflict more than half the world's population . . . POSE A SERIOUS THREAT TO PEACE."

Mankind now stands on the brink of nuclear holocaust which could be precipitated by the food problems of the world. Raymond Ewell, former advisor to the Government of India, said: "The world is on the threshold of THE BIGGEST FAMINE IN HISTORY." When people are hungry, they are going to use any method necessary to meet and fill that hunger. Even if it means war!

For a further study of agricultural and population problems, request the following literature: *Famine — Can We Survive?*, "World Crisis in Agriculture," "The Growing Crisis of Pesticides in Agriculture."

What have we proven? Only that there are *simple*, God-ordained ways for our soil to be kept fertile and productive. Adam was put on this earth and told to dress it and keep it (Gen. 2:15). Neither he nor our ancestors were willing to understand and obey the simple principles of God. As a result, lands which once were productive and fruitful have become barren. The earth's ability to support a burgeoning populace has been diminished. And mankind in all its knowledge wonders why.

No, earthworms alone will never solve the soil problems of the world. No other single method will solve any of the problems of the world. It takes all the principles of God working together to give man the happiness and productivity he desires.

The earthworm is just one link in the chain which will help you enjoy and profit from your soil. Wriggling and dirt-encrusted, yes. But still a marvelous testimony to the wisdom and love of your Creator who provides for our every need if we will obey Him. □

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