

# Fundamental Principles of Health

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DUCTLESS GLANDS.

In a general way what may be said of any single ductless gland may in a large measure be said of them all. Their functions are mainly two. First, by reason of either individual or co-operative secretions they govern the metabolism in the body. Second, these same secretions build up and maintain the body's resistance to disease by cleansing the blood of the different poisons which it accumulates in its current from time to time. It is believed that the internal gland secretions whet the appetite of the white blood corpuscles, or leucocytes, the body's germ destroyer, as a step in this protective plan.

The biochemical salts involved in the breaking down (katabolic) and the building up (anabolic) processes of the body; the 16, and perhaps more, mineral elements existing in organic or living form in the universe and required to maintain the metabolism of all the cells of the human body, are governed, regulated and controlled by the ductless glands. This, of course, is a reciprocal reaction, because obviously there must be something to govern if the glands are to function, and it is equally obvious that the glands cannot function in the absence of these elements or minerals. There being no ducts leading into these glands, it is very clear that nothing can get either into or out of them except by means of the blood stream. Hence, the profound physical and mental disturbance following any disarrangement in the natural or physiological food supply.

The largest of the ductless glands is the thyroid, situated in the fore part of the neck, midway between the "Adam's apple" (thyroid cartilage) and the top of the breastbone (sternum), a point just behind where the average man wears his collar button. The gland comprises two sections, or lobes, one lying on either side of the windpipe (larynx), connected by a neck, or isthmus, the whole forming a flat, oval body about three inches long.

Because the general shape suggests a long, oval, shield, the name "thyroid" was taken from the Greek language—it means, literally, shieldlike.

The thyroid gland is reddish-brown in color and has a vesicular structure—that is to say, the interior is honey-combed with minute sacs like the interior of an orange, each tiny bladder of which under normal conditions is filled with a yellow glue-like compound known as "colloid," a substance diffusing not at all, or very slowly, through animal membranes. Accessory thyroids, varying in size and number, may be found along the lower windpipe (trachea) from the larynx far down as the heart. These accessories possess the same vesicular structure and are supposed to have a function similar to that of the thyroid body.

There are several highly significant facts in connection with the general structure and composition of the thyroid body that it is advisable to keep constantly in mind while considering this subject. Throughout the whole range of animal and vegetable life the catalytic enzymes, or ferment, are constantly busy. They are vitally and fundamentally concerned with life in all its phases, so much so that physiology is rapidly resolving itself into a branch of catalysis. So many catalytic agents are "colloids" and the colloidal condition is so tangled up with catalytic action, ferment and enzymes, it is practically impossible, in our present state of knowledge, to distinguish one from the other. It should be remembered, too, that all kinds of metals and compounds of metals have this powerful catalytic "presence," the potency of which may be so high that in many instances the proportion of but one part to the thirteenth decimal point will bring about astonishing reactions, meantime, the catalyzing substance itself being quite unaffected by its remarkable exertions; it remains as potent as ever and may be used over and over again.

No other gland, large or small, receives proportionally so great and direct a supply of blood as the thyroid. All these facts considered together are sufficient to warrant us in accepting the thyroid as a most important organ and should also prepare us to expect very grave physical results from any disturbance of its functions.

Snugly tucked away behind the thyroid, two of them on either side of the larynx and often actually imbedded in the tissue of that gland, are four small bodies known as the "parathyroids."

The adrenal glands take their name from the kidney: "ad," meaning addition, or proximity to, and "renal" being another name for kidney. These two additional kidney glands are flat, lima bean shaped bodies, each about one and one-half inches long, and they lie in intimate relation with and at the top of each kidney. It is believed both the inner (medullary) and the outer (cortical) parts of the adrenal glands make contributions to the blood stream. The absence of this medullary secretion produces a fall in blood pressure which is fatal.

Suspended by a short stalk from the under surface of the brain hangs another of these pea-like bodies, or baby glands. The early students of physiology believed this gland prepared phlegm or mucus for the moistening of the membrane of the nose, and they therefore called it the "pituitary," which means the phlegm-former. The

pituitary body (hypophysis) consists of two parts, a large anterior lobe of distinct glandular tissue and a much smaller posterior lobe of nervous origin composed chiefly of nerve cells and fibers. Resting in a little bony depression in the base of one's skull, this tiny body prepares and sends out secretions and nerve impulses profoundly influencing us for good or evil.

Among all this complicated maze of action and reaction we are perhaps best familiar with the action of the thyroid gland, and no adequate explanation has yet been furnished of the influence exercised by the thyroid on the nutrition of the body. We have indisputable proof that disturbance in thyroid function induces characteristic symptoms covering practically the entire range of human affliction, and that these disturbances in glandular functions are gravely influenced by our choice of food matter. It is perfectly obvious that this must be so in view of the facts above set forth, and equally clear that Funk's statement that the vitamins, those vital nitrogenous principles in combination with the organic minerals, are the mother substance of the ductless gland internal secretions on which our development, life and health depend, and of which we are largely deprived through the stupid commercial spirit of the age.

## INTERNAL SECRECTIONS.

We find running all through the history of the development of the theory of combating disease a slowly evolving chain of ideas revolving around the primitive belief of the savage that eating the heart of his victim imparted to him the courage and vitality of his enemy.

This idea has given rise from time to time to various methods of organotherapy, all of which have failed to be effective, but which have been valuable because they have served as steps toward a conception of the idea that certain glandular organs give rise to chemical products which on entering the circulation influence the activity of one or more other organs. The term "internal secretions" is used to designate these products.

Claude Bernard appears to have been the first to employ this term to distinguish between the ordinary external secretions and these internal secretions. The belief that the secretory products were given off in this way had long been held in reference to the ductless glands, and this belief was perfectly logical because the absence of any duct naturally suggested such a possibility; but there was practically no interest in the matter of the internal secretions until reports of the work of Brown-Sequard upon testicular extracts were published prior to 1850. This investigator assumed that all tissues give off something to the blood which is characteristic and is of importance in general nutrition.

The idea was taken up widely and led to a strong revival of the old notions regarding the treatment of diseases of the different organs by extracts of the corresponding tissues, but no extract was found to be of any advantage in treating the troubles of the organs from which they were made.

Obviously, vital elements can be expected to flow only from life—that is to say, from functioning—organisms. It is not reasonable to expect more than temporary results from the non-living. However, while Brown-Sequard's idea was not found to be justified by subsequent work, it led to investigation and the development of the methods necessary to demonstrate that not only the ductless glands but some of the typical glands provided with ducts for external secretions give rise also to internal secretions, the pancreas and the liver being examples in point.

We have in our bodies ten or a dozen ductless glands which, as in investigations have demonstrated, play a part of enormous importance in our general nutrition.

The principal ductless glands are the thyroid, parathyroid, suprarenal, thymus, pituitary, pineal, carotid and coccygeal. In some of these the existence or the non-existence of an internal secretion is still an open question, but it is quite safe to assume that, inasmuch as nothing can come into being without a reason and that nothing can continue to exist without a reason, a broader and deeper knowledge of the process of digestion and of our metabolism in general will demonstrate these supposedly useless organs to be endowed with some very important function. The promiscuous removal of "useless" organs is less general than it was and must become less and less as knowledge increases.

Outside the ductless glands the idea of internal secretion has recently found fruitful application in the study of the digestive secretions, and it has been clearly demonstrated that the gastric and the pancreatic "secretions," and perhaps other secretions from lower down in the digestive tract, must be regarded as examples of internal secretions, and that they must be reckoned with in our efforts to secure an understanding of the rapidly increasing mortality resulting from these diseases due to deranged metabolism.

Chemical products of this kind which stimulate the activity of special organs Sterling has designated as hormones, from the Greek word which means "I excite," and he suggests that these chemical products may be regarded as the original or primitive means for co-ordinating the functioning of the various parts of a complex organism. In other words, we are controlled by what may be called liquid nerves acting through our blood circulation as well as by the better known co-ordination secured through the medium of the later developed and wonderfully complex nervous system which we are able to dissect out and follow to its point of origin.

**Farm Profits.**

The farm profits are for the most part made out of yields that are above the average. Average yields seldom pay more than the cost of production.

## COMPLETE SYSTEM OF HOGGING OFF CROPS



Healthy Sow and Litter.

Prepared by the United States Department of Agriculture.

The familiar practice of hogging off crops has been developed by experts in the United States department of agriculture into a scientific system of farm management which, it is said, will minimize, in those sections and those farms to which it is adapted, the cost of harvest labor.

Reduced to its simplest terms this system, which is described in full in Farmers' Bulletin No. 614, "A Corn Belt System of Farming Which Saves Harvest Labor by Hogging Down Crops," consists of a four or five-year rotation of corn, corn, rye and mixture of clover and timothy one or two years. A farm managed on this system should consist of four or five fields of from 20 to 40 acres each, and it is desirable that all the fields should be of approximately the same size. Farms should be laid out in accordance with the following plan:

1. Corn—First year to be hogged off.

2. Corn—Second year to be cut and rye sown.

3. Rye and Young Clover—Hogged off and pastured.

4. Clover and Timothy—Hog pastured.

5. Timothy and Clover—For hay or pasture.

Above is plan of a farm run on a five-year rotation.

In field No. 1 the first year corn is grown and hogged off as soon as it is ripe. This is generally from September 1 to September 10. When the corn is cultivated for the last time, it is usually desirable to sow soy beans or rape, in order that the hogs may have pasture while gathering the corn, and also because such a crop supplies valuable humus which can be turned back into the soil. In the following spring this field is prepared for second-year corn and becomes field No. 2 in the illustration.

Field No. 2 is, as we have seen, devoted to second year corn, which is not hogged off but harvested by hand. Here rye is sown in the fall. Under favorable conditions this can be done while the corn is still standing, but if necessary it is not too late after the corn has ripened, when they are turned back into the rye field and allowed to hog it down without other feed. By the time the rye is harvested the corn in field No. 1 is ready for the hogs.

If none of the stock is sold before, the hogs will gather all the corn by November 1. In this way with practically no labor and very little attention the entire herd is furnished with pasture and grain feed throughout the entire spring, summer and fall. In addition, there is the corn from field No. 2, which is harvested and not hogged down, and the surplus hay from fields No. 4 and 5.

Under this system, the only time when outside labor is indispensable is during the hay harvest. On a farm of a hundred acres it is not probable that this will amount to more than ten days' hired labor, which is certainly much less than is required by the system of farm management in more general use. As for the cash income, it may be said that roughly speaking rye ultimately brings the same returns, whether it is hogged down or cut and threshed and sold. In the latter case, however, there is all the cost of labor to be considered. To save this, it is the main object of the system described.

Field No. 3 is devoted to rye throughout the entire season. In the spring it is pastured by the hogs as long as it is palatable, affording excellent pasture, especially for young hogs and brood sows. When the rye becomes tough and the hogs cease to relish it, they should be removed and not returned to the field until two

## TIME FOR SELLING PIG CROP

Much Depends Upon Price of Feeding Materials and Development of Bone, Muscle and Vigor.

If Rye Can Be Purchased for Less Money Than Wheat It Will Be to Advantage to Feed Them.

The best time to sell the pigs depends upon the price of feeding materials that may be utilized in growing them and developing their bone, muscle and vigor, and preparing them for the fattening period. When we have plenty of forage, skim milk and other home-grown foods, we often find it advantageous to allow them a longer period of growth than when we feed an exclusive grain diet. Market demands are for a medium-sized hog, with plenty of lean meat; strong, but not too coarse bone; plenty of activity and strength to stand up well during shipment.

Fall pigs, as a rule, are less profitable unless the feeder can utilize what would otherwise be waste feed in keeping them through the winter. Pigs that make good gains during the winter, and can be put on pasture in the spring, and then fattened in the fall, often make good gains during the longer periods, and cash in fine profits in the fall. On account of coming to maturity at the best time to breed for spring litters, we have found fall farrowed sows very desirable for breeding purposes. The second season gives them the bone and muscle development.

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## Dairy Notes

Bad hay or fodder should never be fed to the cow.

Sunlight is death to disease germs. Flood the stable with sunlight.

Always provide the cow with a good bed to lie on. Be a good friend to your cows.

Water with the chill taken out is best for the milk cows. Put a heater in the tank.

The reason many cows kick is because they have been kicked first. Ever think about that?

The way to produce milk profitably is to have cows bred for that purpose. Do not try to make a cow do two things at the same time.

Fertile farms are necessary to permanent agriculture is to be established and the dairy cow offers the simplest and best possible means of securing these fertile fields.

**English Sparrow a Nuisance.** The English sparrow is condemned for its destruction of cherries, grapes, pears, peaches, buds and flowers of cultivated trees, sprouts and vines. In the garden, the scientists say, sparrows eat seeds as they ripen, nip off tender young vegetables, especially peas and lettuce, as they appear above ground. We have never experienced this trouble, although sparrows are abundant about the garden. They are a nuisance with their muss building nests in troublesome places

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**The Right Sort.**

"Apropos of the Indians who are fighting in France, a thought struck me."

"What was it?"

"A good kind to use in their trench work would be the Digger Indians."

## FOR COLORED SALADS

DISHES THAT ADD ATTRACTION TO TABLE.

Possible to Make Them in Almost Any Color Desired—Orange Salad One of the Particular Favorites.

**Yellow.**—To make a yellow salad at this time of year use the yellow heart leaves of lettuce. On them put diced orange pulp, dressed with French dressing, and sprinkled with chopped walnut meats. Or else scoop out the centers of small yellow-skinned apples and fill them with a mixture of orange and apple, dressed with mayonnaise made with lemon juice for thinning and flavoring of mustard.

**Green.**—Or green but tender leaves of lettuce, put a little mound of spinach which has been boiled and pressed through a sieve and mixed with French dressing. In the center of each mound, concealed by the spinach, put a spoonful of chopped hard-boiled egg.

**White.**—Celery, potato, chicken-white meat only—white salad, blanched asparagus—any or two of these may be used for white salad. Dress with French dressing or with a white mayonnaise, to which the beaten white of an egg has been added and which has been thinned with vinegar.

**White.**—Strain tomato juice and mix it with equal quantity of white stock—veal or chicken. Thicken sufficiently with gelatin and harden in molds. Serve on white lettuce leaves, with mayonnaise. Place each tomato on a white leaf of lettuce.

**Pink.**—Strain tomato juice and mix it with equal quantity of white stock—veal or chicken. Thicken sufficiently with gelatin and harden in molds. Serve on white lettuce leaves, with mayonnaise. Place each tomato on a white leaf of lettuce.

**Orange Salad.**—Make mayonnaise with much egg yolk in proportion to other ingredients, and thin with cider vinegar. Dice tender carrots and arrange on lettuce leaves, dressing with orange mayonnaise.

**Meatless Mince Pie.**

Half a cup of molasses, two-thirds cupful of water, two-thirds of a cupful of vinegar, one cupful of sugar, one cupful of breadcrumbs, one cupful of chopped raisins, one cupful of minced apples, one tablespoonful of cloves, one tablespoonful of cinnamon, one nutmeg grated, and add a piece of butter the size of a hen's egg. Mix all the ingredients and heat the mixture thoroughly without really allowing it to cook, stirring it often. While hot, fill into the pie pans, baking it with two crusts.

**Baked Apples.**

Select large tart apples. Wash and wipe dry. Remove the centers with an apple corer. Arrange them in a pan, with a very little water, filling the centers with sugar. Dip the syrup over them two or three times while baking.

Serve warm with cream. These may be made more delicate by parting the apples and baking in an earthen pudding dish, filling the centers with sugar, chopped raisins and nuts, a piece of butter and a little lemon juice.

**Fish Turbot.**

Here is a nice recipe called fish turbot: Steam a white fish until tender, take out bones and sprinkle with pepper and salt. For dressing heat one pint of milk and chicken with