

PHYSIOLOGY

A Scientific Method of Weight Reduction

Prevention Is Better Than Any Cure But Diet Restriction Is a Slow But Sure Means: Working It Off Is Hopeless

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THE WEIGHT reduction wave that threatened to reduce all our young women to "bean-pole" outlines a year or so ago has happily in part receded, yet even today the interest in weight reduction is so great that the lecturer on physiology, medicine or nutrition has but to introduce the words, "weight reduction" at any part of his discourse to change a quiet, sleepy group into an eager, agitated, expectant band of zealots, all on edge to secure any last minute advice on the methods of losing flesh. To paraphrase a well-known text we may say, "Some people are born fat, some achieve fatness, and some have fatness thrust upon them." At the outset it is well for the body to be well nourished but not too fat. Babies are usually well nourished. One seldom hears of any efforts to make babies thin, although after they begin to be fed artificially there may be over-feeding with an over-fat baby. In the period of youth and adolescence there is usually, especially with boys, such a tremendous amount of surplus energy and muscular activity, that there is ordinarily no problem of weight reduction. With girls, too, in the grammar and high school age little difficulty arises. One season I had occasion to wait at the front door of a large high school for girls, containing 700 pupils. Not five of those pouring out of the doors could have been charged up as being decidedly too fat.

How Fatness is Achieved

But now, as to those that achieve fatness. The girl who gives up husky or tomboy activities for mid-Victorian repose and gentility begins to have trouble. She loves sweets; she loves delicacies and goodies just as before, but the exuberant activity of the early teens has by convention been repressed. The love for sweets has not been repressed and in goes the food and there is not the former outlet for the energy.

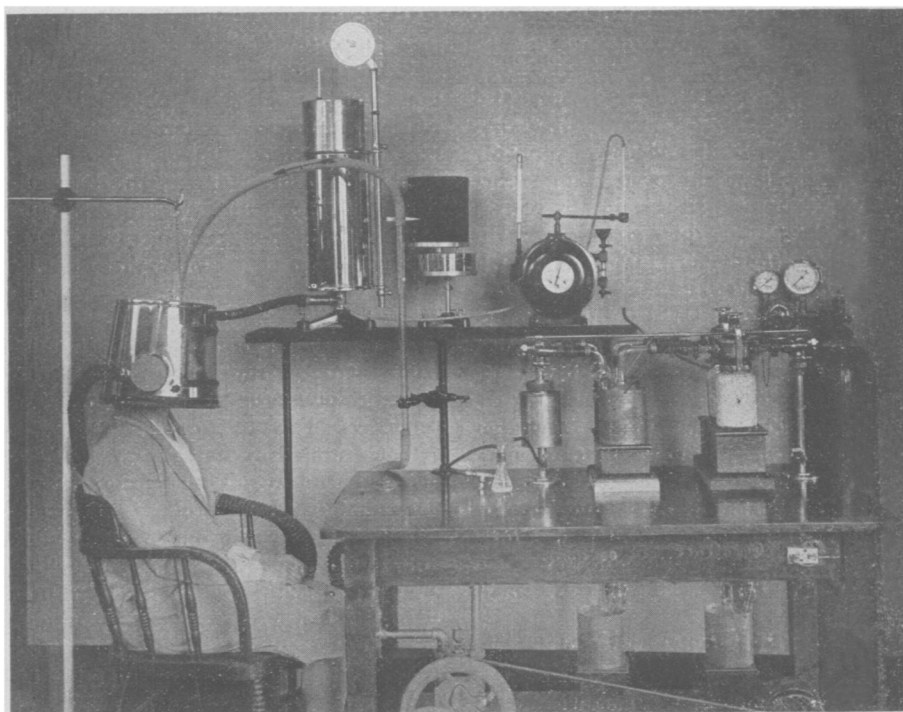
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Our patient now begins to acquire fatness and the fight begins. Frankly until thirty-five years of age the question of over-weight is a matter chiefly of fashion, for a little extra plumpness is from the standpoint of health a real asset in the first three decades of life, since apparently it aids materially in helping to ward off the dread disease, tuberculosis. Statistics perform some curious feats, for apparently the night that you are thirty-five years of age the chances for a longer life are bettered if you are somewhat *under* rather than *overweight*, and it is between thirty-five and sixty years that the greatest danger appears and the struggle against the excess poundage is a real one. Why do people grow fat? There are to be sure a relatively small proportion of people with disordered glands who perhaps may be excepted, but in the vast proportion of cases there is just one answer; you eat each day a *little* more than you require. I repeat that you eat a *little* more than you require. If you eat the equivalent

each day of an ounce of butter more than you need what happens? You don't lose it; you don't burn it; it is digested, assimilated, and note this, it is deposited as fat. One extra ounce of fat means a pound in about two weeks or 25 pounds a year. All of this from but one ounce, say three pats of butter *extra* each day. Please note that I emphasize *extra*; that means three parts of butter *above* your daily needs. This goes on gradually, I might almost say insidiously, until the weight increases, the girth increases, the creases increase, and there you are.

Not Sudden

All this is not sudden. You may not note it or you may wilfully disregard it. You may say, "Oh well, in the spring I'll get out and work it off." How will the bathroom scales help us in this matter? If you have bathroom scales use them at least once a week. If necessary write down your weight and watch the changes. Pay no attention to *sudden* changes either *up* or *down*. Let us see! What about sudden changes? Perhaps the most remarkable instance of a sudden change in weight that I ever knew of was that of a football player who on



APPARATUS FOR MEASURING METABOLISM

Which tells the scientist the rate at which the food you eat is burned up to provide energy and new tissues for your body's needs. Food not used for energy or tissue repair accumulates as fat.

a warm fall afternoon lost 14 pounds during the afternoon and in this time he had played strenuous football for one hour. Now, thanks to careful analysis and studies in the physiological laboratory it is perfectly possible to analyze this loss. Is it all body tissue? Is it fat? Is it water? What part of it is water and what part of it is fat, etc.?

Thirteen Pounds Water

We know that when a football player plays to the limit of human endurance he cannot produce more than say 600 or 700 calories of heat in one hour; in an extreme case 900 calories. Of course during this time he is eating nothing and his heat must come from material that is burned in the body and we will assume that it comes from fat. If this is all derived from fat it would require about 100 grams of fat to furnish these 900 calories. 100 grams of fat would be about $3\frac{1}{2}$ ounces. As a matter of fact, he probably would not burn exclusively fat; he would burn a little carbohydrate and some protein, but we can make an extreme case and say that he might have burned all told 100 grams of fat and 50 grams of either protein or carbohydrate. This is an extreme illustration. This makes a total of 150 grams of dry body tissue burned, that is about $\frac{1}{3}$ of a pound. Now dry body tissue is not peeled off the body either internally or externally as such; it is accompanied by water, and in this particular case we can see that if he burned only $\frac{1}{3}$ of a pound of dry body material and lost 14 pounds there must have been $13\frac{2}{3}$ pounds of that loss due simply and solely to water. This was really a drying out of the body and it was probably all regained in the water and other liquids consumed, so that in one or two days at the outside the weight was essentially back to the original level. This furthermore illustrates the futility of trying to "work off" fat that has been deposited in the body. If it takes the terrific strain of one hour's football competition to work off or burn up $\frac{1}{3}$ of a pound of body tissue what chance has the untrained, soft non-athlete to work off *any* material amount? Work means heat. The heat is derived from food or from body substance, so that by working one does work off body substance, but as we have seen in very small amounts.

To come back to our ounce of fat, let us make it rather than an ounce, a pat of butter, about $\frac{1}{3}$ of an ounce. This $\frac{1}{3}$ of an ounce yields a certain number of calories when burned in the body. Now if this $\frac{1}{3}$ of an ounce is taken in

excess of the daily needs, *only a little more*, to work off that particular extra pat of butter taken on that particular day you would have to do work equivalent, for example, to a walk from the bottom to the top of the Washington Monument.

The best way of all to lose fat is not to get fat. If you are fat then it is nearly hopeless to attempt to "work it off." There is only one way to lose it intelligently, and that is to limit your daily food intake slightly and burn it up slowly, but remember that if we ate each day 3 pats or one ounce of butter *less* than we really needed 25 pounds of fat would disappear in the course of a year. Of course, this could be done more rapidly although with some danger by complete fasting. In thirty-one days of complete fasting you could lose nearly 30 pounds, but again a good deal of this loss would still be water. It is impossible to lose weight and not lose some water, for the body is really 60 per cent. of water, but what you want to lose is the fat and that is the main objective in weight reduction.

Bathroom scales are a very good index for the long pull, for reduction covering months, and you cannot reduce except in terms of months. These fat zealots wish quick results, but think, those of you who are really overweight, how long you were putting on the extra poundage, usually several months if not years, so that you must take off that fat in a proportionately moderate way.

Reduction without the continual cooperation of a good physician may really be dangerous. Rapid results cannot be expected. No overnight treatment is of value. Most of the innumerable proposals for weight reduction other than by intelligent diet control are not worth serious consideration.

Each Calorie Counts

Every extra calorie that you eat, be it from starches, sugars, fat or protein, must be looked upon as a potential fat producer. Fats are, so to speak, twice as concentrated as starches and sugars; hence if one avoids all visible fats in the food this is helpful. Cutting out visible fats is usually not a great hardship, but of itself is of value only when there is no compensation by overeating of other equally fat-producing materials. It is useless to cut out any particular article of the diet, such as bread or potatoes, and then have the person fill up with ice cream. Diets of salads and greens which produce a feeling of fullness are sound in principle but may

easily be overdone and produce digestive disturbances.

Exercise in moderation is, of course, essential to health. Extreme exercise, especially if one is not used to it, may be easily overdone, and then there is always this point to bear in mind. A ten-mile walk to "work off fat" usually is a wonderful stimulant to an appetite all too ready to be appeased.

The use of patent preparations to produce slimness, such as various chewing gums, is nonsense. While it is true that certain glandular extracts and drugs hasten the burning up of material in the body and thus contribute in a small way, at least, to reduction, they are without exception dangerous to use without the continued advice of a competent physician. There is no royal road to slimness. Diet reduction, at times demanding a Spartanlike abstinence from especially loved foods, is the only really logical procedure. It all boils down to a careful, intelligent curtailment of food or fuel intake. It might be termed "scientific stoking."

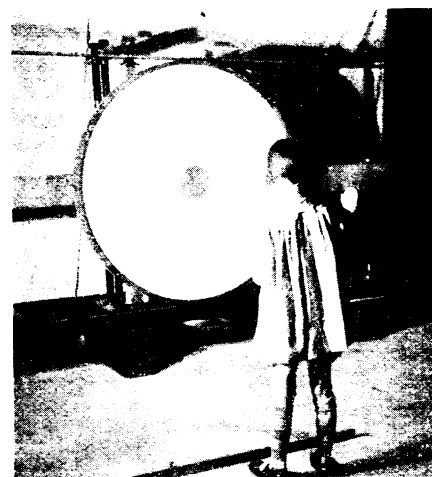
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PSYCHOLOGY

Children Learn Without Taking Special Training

IF YOUR boy wants to be champion basket-ball tosser, just growing older is likely to help him improve his skill as much as long hours of arduous practice.

For children improve in their ability at certain skills, such as weight-lifting, ball-throwing and other games or tasks requiring motor coordination, whether they are specifically trained to do these things or not, Dr. J. Allan Hicks, of



MATURING HELPS

This young lady to improve her skill in throwing a ball at a moving target.