A down-to-earth, refreshing approach to the problems of obesity and its handling is presented. Emphasis is placed on exercise in controlling obesity rather than on drugs, and the point is made that campaigns against obesity may be based on ill-understood data. More reason and less emotion are prescribed.

OBESITY, THE NUTRITIONAL SPOOK

George V. Mann, Sc.D., M.D., F.A.P.H.A.

Introduction

IT is useful for nutritionists to consider that obesity has been wrongly indicted as a major public health problem. The attainment of obesity is in fact a physiological goal accomplished in man's struggle with his environment. To be able to be obese is the badge of one's solution of his food problem—the fat man's cup runneth over.

Only extreme degrees of obesity carry health hazards. The rest of us are not impaired by the 15–35 per cent of our body content which is fat—we are in fact insured by it. As Hippocrates said in Aphorism 35, "In all maladies, those who are fat about the belly do best. It is bad to be very thin and wasted there." Unhappily the western world is plagued by nutrition experts, professional and otherwise, who view obesity—in someone else—as a moral issue. These people take the old-fashioned medical position which presumed that patients were sick because of their sins. There are only a few of these "immoral" diseases left in medicine—obesity, alcoholism, venereal disease, and infectious mononucleosis.

We can be sure that if obesity did not exist, the human race would not have survived, nor would many of our dietitians who busy themselves jawing futilely with obese people. Few other conditions are so refractory to treatment. Nearly every form of cancer has a higher cure rate than does adiposity. We weep and sympathize over cancer and its inevitability, and yet we scold and accuse over obesity.

This fussing drives many fat people into the hands of quacks and frauds because, as Mayer has said, "that solution is, for the fat man, an effort to avoid unmerited guilt."[1] Officials of the American Medical Association say the reducing fads cost the public 100 million dollars per year. Investigators in the Post Office Department allege that medical quackery costs the nation more than all crime combined. This is indeed an expensive and dangerous spook. Now *who* are the sorcerers?

In antiquity the Druid priests of ancient Gaul and Britain celebrated a harvest home festival which they called Samhain, that is, summer's end. This was in time merged with a religious holiday, All Saints' Day, and the two became our Halloween. The symbols of those early feasts were the pumpkin and the grain sheaf—not maize—because that plant was still an American treasure. We might use the pumpkin and the sheaf in this Halloween season to symbolize our subject.

The pumpkin, so full and round and desirable; the sheaf, so dry and drained and finished. It is curious that our social attitudes about pumpkins and

sheaves have changed so dramatically in the last hundred years. In olden times fatness was good and desirable. It wore a white hat, while leanness was evil and mean and wore a black hat. But there has been a transformation, especially in the last fifty years. Now we have the leaners wearing the white hats and the pumpkins are in black. The fact is that we associate a moral judgment with our estimate of adiposity as a gratuitous and prejudicial act. This is wrong, especially for health scientists, because it causes great trouble and anguish. It reflects badly upon our professional image. We may in fact be preserving a wrong image.

This evil view of obesity has come from four places, the insurance industry, the medical moralizers (usually themselves thin), the drug industry and the docile, unquestioning nutritionists who are too often dupes of the faddists and the hucksters.

The insurance industry is plagued with too many measurements, too much data. It accumulates inordinate amounts of tabulations of such things as height, weight, and maiden name of mother, set down by harassed physicians who, more often than not, do not measure—they just ask. From time to time, the actuaries have regurgitated these numbers. Vintage years were in 1912, the Medical Actuaries Report, 1923 the Davenport Weight Tables, and 1959, the year of the Build Blood Pressure Study.[2]

The height-weight tables were used to make value judgments about optimum weight for height. The late Louis Dublin championed two "causes" in this matter. He promoted the notion that these vast tabulations of heights and weights were a basis for postulating an "Ideal" weight. Somewhat later, he toned the language down to "Desirable" weight. He thought the whole scene would be a little neater if he allowed each of us to judge the size of his own frame. Thus, the weights for height by sex were smoothed, and the distributions were trifurcated. Those on the light end were called "small frame," those on the heavy end "large frame" and the middle third were said to have an "average frame." He and nearly everyone else neglected to reflect that there *is* no adequate way to measure frame but this practice gave a good deal of room for maneuvering, especially for the light and the heavy. Dublin also argued intuitively that a person ought *not* to gain weight after age 25. Any weight gain after 25 years was probably fat and thus desirable weight was weight for height and sex at age 25, using the insured population as a reference base. The Metropolitan Life Insurance Company used these postulates as a basis for advertising its products, for promoting what it thought was the public welfare, and for whipping its customers into shape. For many years it was the Met's *thing* to scold about obesity. Now who are these insured persons who were set up as our paragons? They were mostly urban, Atlantic seaboard, industrially employed persons of 50 years ago who, in the first place, have bizarrely high mortality rates in the first years after buying insurance. They seemed to know something about their health which the companies did not know. After this early dying, the insured died less rapidly than the rest of us—they seem to be privileged.[3] (Figure 1). Whatever the reasons, we might have reasonable doubts

Figure 1

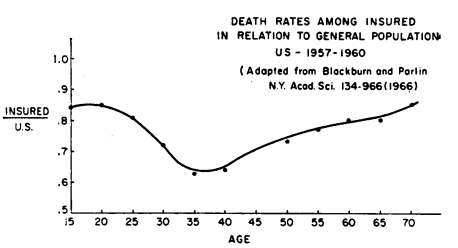


Table 1—Causes of death in overweight insured men expressed as per cent of rates observed in insured standard risk men. (Adapted from Herbert Marks).

	% Standard
Diabetes Mellitus	383
Cirrhosis of the Liver	249
Appendicitis	223
Cholecystitis	206
Cardiovascular-Renal	149
Accidents	111
Pneumonia	102
Leukemia	100
Cancer	97
Suicide	78
Peptic Ulcer	67
Tuberculosis	21

about the validity of using this kind of a population and these rough measurements for generalizing to all the rest of us. Furthermore, there are some highly illogical causes of excess death among those overweight insured—causes which are hard to explain by obesity. (Table 1).

If one looks at the experience of the prospective studies of cardiovascular disease, it is clear that obesity is a weak and inconsequential risk factor (at least until it reaches large proportions) as in persons with a relative weight over 1.25. (Figure 2). In the Framingham Study, the same impotency of obesity as a risk factor is seen for coronary heart disease, all forms.[4] (Figure 3).

In the seven-country study of coronary heart disease done by Keys, et al.[5] the conclusion was reached that when the contributions of high blood pressure and hypercholesteremia are factored out, the strength of obesity alone as a predictor for CHD is very small and of borderline statistical significance. The evidence indicting obesity as a cause of ill health, (excepting adult onset diabetes), is very weak.

Obesity has some uses that are often forgotten. There are four worth mentioning: flotation, flirtation, starvation and insulation. Everyone knows that plump people are more buoyant. The survival advantages of the obese during famine and food storages are well-documented. A good documentation is that of Valoaris in the Greek famine of 1942.[6] In many societies the prime qualification for feminine allure is plumpness. In Africa, some tribes have uniquely well-placed adipose deposits—handy, available and really quite chic!

Figure 2—The frequency of obesity has been derived from several cross sectional studies of U.S. citizens. The mortality ratio for relative weight from the Framingham study (Ref. 4)

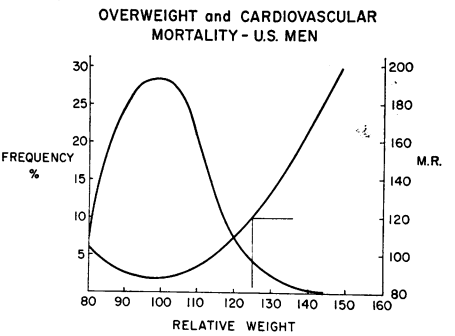
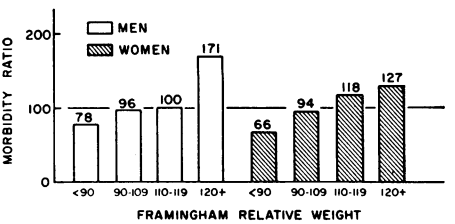
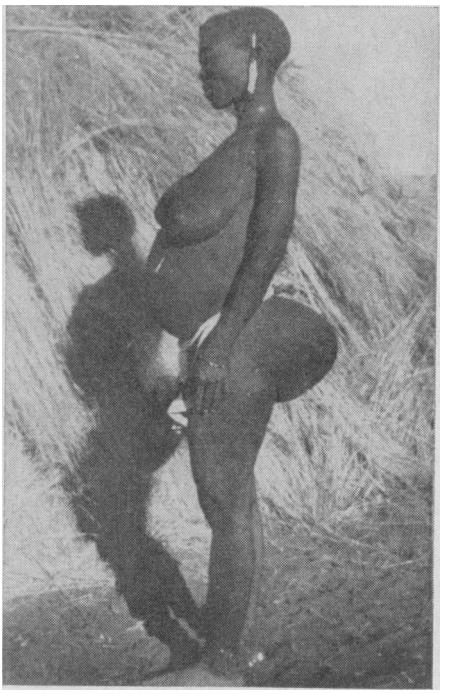


Figure 3—Adapted from Framington report (Ref. 4)



Risk of developing coronary heart disease in 12 years according to Framingham relative weight. Men and women, 30 to 59 years of age at entry to Framingham heart study.

Figure 4—STEATOPYGIA OF HOTTENTOT WOMAN, by confining accumulation of most body fat to buttocks, leaves rest of body relatively free of fat. Body can thus better dissipate heat.



(Figure 4). In the cold Arctic seas and its shores, the mammals store their fat subcutaneously, with the interesting consequence that the hunter's diet there is quite lean, the fat being removed for fuel. (Table 2). It can be shown that the ideal emergency ration is adipose tissue. The best preparation for a risky trip is not a cumbersome package of pemmican or a case of tinned rations, but 20 pounds or so of adipose tissue put on deliberately before the expedition starts. The arithmetic is in Table 3.

Obesity and the obese are often abused. The faddists, the moralizing nutritionists, the food promoters, the pregnancy do-gooders and the drug pushers are each examples with different degrees of depravity. The Rainbow pill disgrace is still about but more distressing is the quasi-scientific use of gonadotrophic hormone for the treatment of obesity.[7] This treatment was proposed by Simeone. The tip-off to his regimen should have been that *all* his patients are successfully reduced—because, so Simeone says, "if they don't lose weight they are not following my program," and he abandons them. And yet this specious promotion is used by many qualified internists.

In the past summer, Robert Choate tackled the breakfast cereal industry with the charge that their advertising is misleading and their products are second-rate foods. Predictably, he drew a shower of slings and arrows, many fired by famous nutritionists such as Sebrell and Stare who sprang to the defense of their old friends at Kellogg's, Quaker Oats, and General Foods. Here is an extract from the testimony of Dr. Michael Latham who agreed with Choate.[8] Latham said, "A special advertising onslaught has been made on our children by these breakfast cereal promoters." Latham's suspicions of their promotions were primed, as were mine, by the recollection that five major drug firms have recently admitted that they rigged the price of tetracycline for many years, putting it out of the reach of thousands of dying people. Latham compared three "breakfast cereals" with the cereals from which they are derived. (Table 4). It is quite clear that these companies are selling convenience under the guise of nutrition. These processed cereals are overpriced, partly because one-third of their cost is taken for advertising. Only the soap and cosmetic industries, promoting necessities and dreams, spend a larger fraction of income on advertising. The promoters like to sell their products as low-calorie, low-fat cereals to overweight adults and on the other side of the street they sell the same products for undernourished children. Processed breakfast cereals are a

Table 2—Fat content of Arctic food compared with several commonly eaten U.S. meats

gm/100 gm. Edible Portion—Uncooked

Alaskan Eskimo			United States		
Item	Protein	Fat	Item	Protein	Fat
Seal	32	1.8	Veal side	19	12
Walrus	27	12.0	Chicken	20	13
Whale	24	0.7	Pork side	12	45
Oogruk	27	0.4	Lamb side	16	28
Caribou	27	1.2	Beef roast	17	23
Moose	26	1.1	Beef steak	16	25
Polar bear	26	3.1	Hamburger	16	28
Beaver	14	39.0	Frankfurter	14	21

Table 3—The energy yields of several emergency survival rations and the energy needs of mountaineers

Energy yield	kcal/lb.	
Body fat	3250	
Pemmican—U.S. Army	3600	
Beauvais	3400	
Armour	2750	
British	2650	
Energy needs	kcal/day	20 lbs. adipose
Mountaineering	5000	13 days
Holding on	2000	32 days

bad buy for both. The same promoters like to talk about the low-fat content of their products without milk when aiming at the middle-aged, and talk about the high nutritional value with milk when they aim at children. They speak with a forked tongue! They emulate Al Capp's advertising man, Rock Hustler, who sells "mockeroni" to the overweight and says, "a smart promoter knows how much truth to leave out." Latham wonders if we need a Radio Free America to re-educate our misled

Table 4—Comparison of nutrient content and costs of three typical "cereals" with their cereal of origin. Adapted from Latham. Ref. 8.

Nutrients/100 gm Edible Portion USDA Handbook #8 1970

	Cal.	Prot. gm.	Ca mg.	Fe mg.	A units	B_1 mg.	B_2 mg.	Niacin mg.	Cost
White bread	314	10.1	81	2.8	tr	0.23	0.20	2.7	
Shredded wheat	354	9.1	43	3.5	0	0.22	0.11	4.4	X2
Corn grits	362	8.7	4	2.9	440	0.44	0.26	3.5	
Corn flakes	386	4.4	12	1.0	0	0.41	0.04	1.9	X2
Rice parboiled	369	7.4	60	2.9	0	0.44	0	3.5	
Puffed rice	388	4.2	46	0.9	0	0.33	0	4.6	X5

youngsters. The 42 million dollars spent on advertising of dry cereals for television for children in 1969 would buy a lot of health education—or a lot of groceries—or a lot of housing—or even a lot of tetracycline.

The National Academy of Science has recently released an expensive paperback ($7.50, 241 pages, 1970) entitled, "Maternal Nutrition and the Course of Pregnancy."[9] After all those sermons about holding weight down during pregnancy we now are told "there is no evidence that women with a large total weight gain due to excessive accumulation of fat are more likely to develop toxemia." There is something rather frightening about these official committees which meet to pass biological laws, especially when they begin repealing their earlier legislation.

The most disgraceful chapter in the professional management of obesity is extracted from the current drug scene. The story started in 1939 when Nathanson synthesized amphetamine, the congener of epinephrine and showed it was a central stimulant. In 1938 it was shown that amphetamine would impair appetite.[10a,b] The rest was automatic.[10c] The drug houses began to promote amphetamine for the treatment of obesity, and soon the product and its derivatives were flooding the market and our sample drawers. The volume of the business was quickly out of proportion to even the prevalence of obese people because amphetamine was a potent mood elevator, an "up" which could be coupled with barbiturates a "down." In 1967, eight billion doses of these mood elevators were produced in the United States. This amounts to 40 doses per person per year. A little less than 5 per cent of all prescriptions in the United States were for stimulants in 1966, and 50 per cent of the amphetamine produced is believed to have gone into the illicit drug market at a rate of 10 cents to 1 dollar per pill.[11]

Sweden showed the way in this illicit business, but with our own industry and physicians helping. During World War II amphetamines by mouth became popular in Sweden. About 1950, a Swedish medical student, who is mercifully never named, tried taking amphetamine intravenously. He experienced profound accentuation of all his senses—sight, sound, smell, touch, hearing and taste. The word got around quickly, so that by 1964 there were 2,000 mainlining addicts in Sweden, mostly using phenmetrazine which is Preludin in our slick medical journal ads. The usual practice is to take 250–1000 mg 3–6 times per day intravenously, producing a sensational high with hyperactivity and insomnia for days at a time and often leading to psychosis. To get down, the subject takes barbiturates and sleeps, awakening with a great need for another high. There is no doubt that the drug used in this way is a powerful aphrodisiac, excepting possibly Englishmen, who are of course different in all respects!

The Swedish officials saw trouble with amphetamine in 1944, and classified it as a narcotic. In the 1950s, Preludin and Ritalin, new products related to amphetamine, were allowed into Sweden uncontrolled, and they soon replaced amphetamine in the drug scene. By 1965 there were 3,000 addicts in Sweden, many getting their drugs on fat girls' prescriptions. The obesity "treatment" was the screen for a drug promotion supplying the illicit trade. The Swedes tried an unsuccessful two-year program of allowing addicts unlimited supplies of Ritalin through authorized physicians. This scheme failed utterly. Now, all these mood elevators are rigidly controlled in Sweden and are available for particular medical uses only, through specifically authorized physicians. Obesity is not an indication, but the bootleg market in these drugs remains.[12]

Table 5—Sales of appetite suppressing drugs, 1967, U.S. (from Fineberg, S. K. Nutr. Today 2:4, (1967)

New prescriptions	14,500,000
Refills	31,000,000
Cost	$66,000,000

Table 6—The arithmetic of reducing

1 lb. body fat 3250 Kcal

1 lb. wgt loss/week is safe max.

$\frac{3250}{7}$ = 464 Kcal loss/day

1 hour walking on level costs 350 Kcal

1 hour workout may cost 800 Kcal

4 workouts/week = 3200 Kcal—*no diet*

In the meantime, the U.S. companies went unscathed with doctors prescribing and samples flowing in the illusion that amphetamine and its congeners were an effective treatment for obesity. (Table 5). Dr. Walter Modell reviewed this subject for the A.M.A. Council on Drugs in 1960,[13] and found little evidence to support the contention: Amphetamine and its congeners are not effective treaments for obesity.

In August 1970, Commissioner Edwards of the Food and Drug Administration put new labeling restrictions on the mood elevators, largely because of pressure from the Florida congressional delegation. Representative Rogers contended that 20 per cent of the U.S. drug scene was caused by "speed," i.e. amphetamine. Senator Pepper found that 8 per cent of all prescriptions written in the U.S. in 1968 were for stimulants.[14] One might ask with the late Frank Clement, "How long, Oh Lord, how long?" Where have the docile nutritionists been?

What is the proper management of obesity? Well-trained nutritionists know that obesity has two sides, underactivity and overeating. Overeating in an abundant culture requires neither courage, skill, learning nor guile. Gluttony demands less energy than lust, less effort than avarice.[1] We have no proper anorectant. We rarely see obesity in cultures where physical work is necessary. Our only effective treatment, whether preventative or curative, is physical activity. The role of the professional is to explain these realities to concerned people. The educator and the physician have the obligation in their treatments not to increase the subject's health hazards. There is no gain in driving fat people to faddists, or to drink or to eternal anguish. There is no more sense in an ileal bypass for the treatment of obesity than in treating a cigarette-smoker by cutting off his hands.

The arithmetic of reducing is quite simple. (Table 6). The need is for regular, vigorous exercise. There are some other merits in the fitness produced, and there is an outside chance that the physical activity might produce some useful work. This spooky world would no doubt be both healthier and happier if we stopped leaning on the full, round pumpkins and stopped adulating the thin, dry sheaves.

REFERENCES

1. Mayer, J. Overweight, Causes and Control. Prentice-Hall, 1968.
2. Society of Actuaries. "Build and Blood Pressure Study." Chicago, 1959.
3. Blackburn, H., and Parlin, R. W. Antecedents of Disease. Insurance Mortality Experience. Ann. New York Acad. Sc. 134:965, 1966.
4. Kannel, W. B.; LeBauer, E. J.; Dawber, T. R.; and McNamara, P. M. Relation of Body Weight to Development of Coronary Heart Disease. Circulation 35:734, 1967.
5. Keys, Ancel; Aravanis, C.; Blackburn, Henry B.; van Buchem, F. S. P.; Buzina, Ratko; Djordjevic, B. S.; Dontas, A. S.; Fidanza, Flaminio; Karvonen, Martti J.; Kimura, Noboru; Lekos, D.; Monti,

Mario; Puddu, Vittorio, and Taylor, H. L. Epidemiological Studies Related to Coronary Heart Disease: Characteristics of Men Aged 40–59 in Seven Countries. Act. Med. Scand. Suppl. 460:392, 1966.
6. Valoaris, C. Medical Description of the War Famine in Greece. Milbank Mem. Fund. Quart. 24:215, 1946.
7. Albrink, M. J. Chorionic Gonadotropin and Obesity? Am. J. Clin. Nutr. 22:681, 1969.
8. Latham, M. C. Testimony to U. S. Senate Subcommittee on the Consumer. Committee on Commerce, (August 5), 1970.
9. National Academy of Sciences, Committee on Maternal Nutrition of the Food and Nutrition Board. Maternal Nutrition and the Course of Pregnancy. National Research Council, Washington, D.C., 1970.
10a. Nathanson, M. H. The Central Action of β-aminopropyl-benzene (Benzedrine). J.A.M.A. 108:528, 1937.
10b. Lesses, M. F. and Myerson, A. Human Autonomic Pharmacology: Benzedrine Sulfate as an Aid in the Treatment of Obesity. New England Jour. Med. 218: 119, 1938.
10c. Harris, S. C.; Ivy, A. C., and Searle, L. M. The Mechanism of Amphetamine-Induced Loss of Weight. J.A.M.A. 134:1468, 1947.
11. Luria, D. B. The Drug Scene. New York: McGraw-Hill, 1968.
12. Perman, E. S. Speed in Sweden. New England J. Med. 283:760, (October 1), 1970.
13. Modell, W. Status and Prospect of Drugs for Overeating. J.A.M.A. 173:1131, 1960.
14. Editorial. And Pep in America. New England J. Med. 283:761, (October 1), 1970.

Dr. Mann is Career Investigator, National Heart and Lung Institute, National Institutes of Health, and Associate Professor in the Departments of Biochemistry and Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee 37203.

This paper was presented before the Section on Food and Nutrition of the American Public Health Association at the Ninety-Eighth Annual Meeting in Houston, Tex., October 27, 1970.