hyperexcitable, presumably as a result of central facilitation. From this, it seems reasonable to suggest that other nervous mechanisms, including feeding reflexes, may be correspondingly facilitated.

Another important reaction essential for normal feeding is movement or locomotion, as animals, including infants, are more restless just before they eat. The neurologic basis for locomotion is similar to that of feeding itself, in that the spinal cord and lower brainstem contain centers which, at least in laboratory animals, may induce rhythmic stepping and even progression, while the higher centers include a facilitatory mechanism in the hypothalamus, and an inhibitory one in the basal ganglia. Appetite appears to be a condition of generalized increase in locomotor activity and facilitation of feeding reflexes, which together tend to bring the organism into contact with food and to lead to its ingestion.

"Satiety," on the other hand, is regarded as a state in which there is a lack of awareness of food and a reduced activity, possibly even to a point of somnolence.

Infants appear to be the only satisfactory subjects for study of these problems in the human species. In adult subjects the more fundamental reactions become so obscured by training, experience, habit and social factors that trying to clarify them appears to be almost hopeless. An infant, by contrast, although complicated enough, possesses behavior much more susceptible to analysis. If knowledge gained from study of lower animals is to be tested adequately in man, I believe that babies will prove to be by far the best subjects for this purpose.

REFERENCES

A PEDIATRIC-PSYCHIATRIC VIEWPOINT ON OBESITY
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From the viewpoint of the pediatric psychiatrist, the problems of obesity, as seen clinically, can be thought of as having three layers. The first is constitutional, better described as physiologic, which may be broken down into genetic and structural elements. The second is psychologic, consisting of the values that food intake or the obesity itself come to have. The third layer is made of the cultural and social reactions to food and fat. These attitudes encountered inside and outside the home inter-
mesh in their effects with the physiologic and psychologic levels. These, in turn, are also interwoven, until one cannot separate one layer from the other. However, when individual cases are scrutinized they reveal the pathology at one layer or the other to predominate and indicate where efforts to modify the abnormality might best be directed. Incidentally, the same levels operate on the other side of the coin, anorexia.

From the practical point of view, let us consider the natural history of obesity and the clinical varieties one sees in practice, and let us see how the three-layer concept fits. First, as pointed out by Gordon, there is a tendency to be complacent or even pleased with obese infants. At level one, the physiologic, such constitutional factors as those present in the neonate born with an excessive quantity of pepsinogen secreted by the gastric mucous membrane could have the effect of producing as Mirsky points out, a relatively intense or even continuous hunger, and make greater demands on its mother for nursing. Thus, the second, the psychologic layer, becomes involved, if the mother cannot meet these demands. The child may continue to search for substitute sources of stomach gratification and excessive, indiscriminate appetites may develop.

There is also a basic psychologic equation that develops around feeding that might be mentioned. As the infant becomes able to perceive, it realizes that food comes not just from the breast or bottle. There is a person behind the breast or bottle. Food, then, comes to mean "mother," and as mother and love become synonymous, food becomes equal not only to mother but also to love. This equation remains important throughout life and anything going wrong with one element in the equation affects the others. Where an individual from infancy onward worries about or experiences loss of love, preoccupation with food can be part of an attempt to make up for the loss.

The third level, the cultural and social, applies to infants through the attitude of the parents toward food. One wonders what influences we, as doctors, contribute along cultural lines. What are the influences, for example, of demand feeding and the very early introduction of solids on the psychologic and physiologic levels?

As a general rule, there is usually no reason for vigorous intervention with fat babies simply because they are fat. Unless there are complications, most of them begin to assume more "streamlined" appearances by about 18 months of age. The excess weight is a signal, however, to scrutinize the situation to see if there is significant abnormality at any of the three levels that would call for intervention.

This leads us into the second clinical group in which there is a continuation of obesity from infancy. Aside from the genetic and structural factors which are gradually becoming better defined, one sees the constitutionally passive child who acts as an accepting extension of his mother's interest in the diet. I remember one family where the husband had to eat every scrap of the elaborate meals the wife made. When the baby was born, the father was no longer subjected to such pressure. Also, some children readily accept the "eat everything on your plate" approach. If these patterns of passive acceptance of overeating continue, they can be taken over by the child. Somewhere between ages 3 and 5 years we see some children who continue the pattern on their own.

It is not always the food that is so important: mouth-stimulation may be constitutional; for example, some babies can never get enough sucking, but it may also be induced. There are parents who enjoy stimulating the baby's mouth; they pull the nipple in and out of the mouth as the infant nurses. In addition, there are children whose lives are quite sterile and devoid of other forms of stimulation. Some overprotected and some institutionalized children fall into this category. There are families, including families of doctors, where the only satisfying family contacts are in relation to meals. The end result of these various pat-
terns can be addiction to food, alcohol or drugs. There is growing evidence from life studies that the roots of such addictions are in early childhood, and the addiction to food can be as severe as any of the other cravings. We find many of the same patterns operating in children suffering from lead poisoning and with other forms of pica that we have been studying.

One group of overweight children is made up of those who use food as a refuge. Anything coming up in the life experience that causes anxiety or tension causes these children to turn to food as a means of relieving their anxiety. That people may become obese in the face of adversity is well recognized. We can summarize the causes of anxiety in children by saying that in the face of situations such as failure to negotiate or to find healthy answers to the normal stages of personality development, and in the face of fears of rivalries or separations or hurts or illnesses, and with failures in working out social satisfactions, anxiety can develop. In the face of the anxiety, a return to an earlier, more comfortable level of adjustment to relieve the anxiety can include a return to earlier preoccupations with food. However, the drive to be normal is great. The problems connected with most situations encountered in growing up are solved, so that in a majority of cases the fears, depressions and social disturbances disappear. Then the need for excess food disappears as does the obesity. This type of obesity is most often what we hope is present when we tell parents the child “will grow out of it.”

It is obvious that the routine referral of obese children for psychiatric therapy would be both inappropriate and ineffective. It is particularly true if the major reason for the overweight is cultural, social or physiologic, even though emotional overtones and values are built up to some extent in every case. For categories in which the psychologic difficulties are predominant, a diagnostic evaluation to determine the suitability of a child for treatment is often helpful, particularly to eliminate the children who are not ready for or should not have treatment at a given time. In fact, the obesity sometimes is a protective barrier behind which there may be very upsetting, conflicting feelings. The individual may not be able to cope with such conflicts without serious upset if the barrier is removed. This does not mean that psychotherapy as it is available in the pediatrician’s office on a supportive, motivating or other corrective basis cannot be helpful in many children. For example, in early cases where eating is becoming an addiction or where food is being used to relieve anxiety as part of dealing with normal stages of development, the child’s doctor is often the one in the most strategic position to help. One must be as clear as possible as to the source of anxiety if one can be helpful to the individual.

When treatment is indicated, the earlier it can begin, the better. A major mistake in treatment is to start where the individual is not upset or at least a little uncomfortable about being fat, that is, where the purpose served by the food intake is more important than social acceptance, family wishes, etc. Where there is no anxiety about being fat, and it is important to correct the overweight on possibly a medical basis, we have to create anxiety. This should not include imposing threats. If one succeeds in reducing the intake of food on that basis only, it is by shifting the anxiety from its original source to the problem of eating, a step in the wrong direction.

Considering the three-level concept, cre-
ating fear would fit in at the second, the psychologic, level as would stirring up the conscience. The ideal really is to approach the basic cause of the anxiety, but in a busy pediatric practice this is easier said than done. Therefore, from a practical viewpoint we may have to rely chiefly on the other two levels as a compromise; the first, the physiologic, may be approached with diets, appetite depressors, etc., recognizing that these are just adjuncts; the third, the cultural and social levels, may be used successfully if timed correctly. These involve chiefly the use of the family. When we approach the family as an adjunct in treatment of obesity, we have to ask the question, why is the obesity a problem to them and to the individual? If the problem is primarily a medical one, the necessity to relieve it depends on whether there is acute discomfort or danger, or whether we are approaching it on a preventive basis, with long-range difficulty to be anticipated. Where it is purely preventive, the problem is often only that of the doctor. His anxiety is involved. It might involve the family's anxiety but it is not necessarily the child's. If it is basically a social problem, the question should be raised, to whom it is a problem? Is it merely the immediate difficulties around dates and popularity? This is not a really fundamental question because in the over-all picture the fat girls, the skinny girls and the ugly girls get married. In other words, the ideals of beauty and the standards for choosing the individual with whom one wants to live are formed at a much earlier time in life. The influences of the advertising profession and its ideals of beauty are not necessarily influential in the over-all picture. Where the mother is mostly concerned, one has to be cautious that modifying the obesity is not used by the patient as a way of fighting the mother. This fight can become more important to the individual than more dates. We see individuals who are afraid to have a social life and, to such children, the obesity could be a protection. Where there is a fear of bodily hurt in the individual, or a fear of physical activity, the fat again acts as a protection and would be given up with great reluctance, if at all, by the individual who would then be exposed to the basic fear. If the obesity is a blow to self-esteem, the question to be raised is whose esteem is involved. Is it the mother's and the family's or is it the child's?

In deciding on a program of treatment there is an economic problem as to which side of the situation has more weight (a term to be used advisedly in this connection). Is it the discomfort of the overweight or the need to eat that is predominant? If it is the family that is most concerned, one has to be careful that, if a reducing regimen is started, previous tendencies to battle shift to battles about food. Thus, we see again we have to individualize our approach to reducing. I remember one obese young child who became preoccupied with food when a new baby was born and he began to worry that mother did not love him anymore. Withholding food and keeping him to a diet focused mother's thinking on this youngster so that her eagle eye was on him to keep him away from the refrigerator between meals. He began to feel with all this watching that mother really did care for him after all, and the need for the excess food was removed. On the other hand, another overweight youngster who felt that mother was a punishing, depriving person, when put on such a diet, said, "The old witch won't even let me have food now," and of course in that situation the diet could not work.

The timing of the reducing effort is very important. Often we have to wait until the situation has become decompensated and then we can stop it successfully. Sisson, in a recent paper, has made the cogent observation that a few more weeks or months of fat will not harm the individual in the long run. Once the situation has changed, that is, the homeostasis in the family or in the social area has changed, then one can intervene successfully. At such a time, how-
ever, if the doctor has prescribed dieting and it has been unsuccessful, the child or the family may feel that they have disappointed the doctor before and may not return when they need help.

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A SUMMARY OF SOME CLINICAL ASPECTS OF OBESITY

By Harry H. Gordon, M.D.
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A S A POINT of departure for this summary I wish to present an outline of mechanisms for the development of obesity. With minor changes, it is one recently proposed by Van Itallie1 and is based on the concept that there exist multiple etiologic factors—genetic, traumatic and environmental—in the development of obesity.2

The fact that there are two main categories—1) regulatory, i.e., with no primary metabolic abnormality, and 2) metabolic—does not imply that patients with obesity obey some law higher than that of the conservation of energy. Studies by Newburgh and his co-workers3 established this for all patients beyond argument from wishful nonbelievers. Mayer2 has stressed, however, that Newburgh's work should not serve as a rigid, at times puritanical, obstacle to consideration of the problems of individual patients, a point of view inherent in Newburgh's listing of different "proximate causes to which some persons respond (in part) by overeating."4

Patients with a regulatory disorder may develop obesity as a result of increased caloric intake or decreased caloric output or frequently both. Under increased caloric intake, we have two categories, "organic" and "functional." We have put quotes about both headings because this common form of categorization implies a sharp division in our thinking and sometimes interferes with our therapeutic approach to patients; most of us still feel more comfortable with a patient whose complaints are organic rather than so-called functional. We think of nephrosis and galactosemia as organic diseases but, in the present state of our knowledge, have to fall back on calling the increased glomerular permeability of the former and the enzymatic defect of the latter, lesions in chemical anatomy. Perhaps advances in electronmicroscopy5 and histochemistry6 will ultimately make use of this term more literal.

Injury of the hypothalamus in experimental animals as described by Brobeck7 and disease, such as encephalitis or brain tumors, may lead to hyperphagia and obesity.8 Wilder9 considered psychologic overeating a functional disorder of the hypothalamus, attributed by Mayer to a diminished arteriovenous difference of glucose in the hypothalamus. The details of this theory and the objections to its acceptance are summarized in a monograph of the New York Academy of Sciences.10

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