ment. The measure of success will depend largely on the enthusiasm and understanding with which this double-headed campaign can be launched. But before we can even plan such a campaign, we must have a better command of the facts and know more than we do now of the underlying causes of mortality and of morbidity, especially at the middle ages of life. We are, to-day, woefully lacking in knowledge of the processes which produce aging and degeneration. Research into the causes of such premature aging would yield information of inestimable value. Fortunately, the files of physicians contain the facts upon which a wise future policy must be based. If they kept full and accurate records of their cases of the degenerative diseases, it would be a comparatively easy matter later to determine some, at least, of the processes which we must combat. Possibly no better result could come out of this symposium on old age than the organization of such a coöperative research into the causes which make for premature old age. Every physician in practice can play his part in such a venture.

DIETETICS IN OLD AGE [1]

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When we are young I think most of us wonder why anyone desires to live to old age, with its physical difficulties and mental deficiencies. In middle life we become more tolerant, thinking there may be some excuse for becoming old; while after we pass sixty, and are very sure it is most desirable, we will attempt almost anything which promises to prolong life, even if our ideas on the subject are vague, and procedure uncertain. Leaving aside, therefore, the large question as to what practices in youth and middle age may reasonably assure a long life (questions of much depth and complication), we shall confine ourselves to those already old; considering whether through

[1] Delivered October 4 ,1928.

forethought in diet, they may expect even longer life, and that with health and easy regulations alone.

The discussion of "Dietetics in Old Age" necessitates encroaching upon topics assigned to other speakers, but I shall endeavor to minimize this intrusion as much as possible.

Age is a period associated with innumerable theories. Each individual who lives a long while ascribes his success to some particular pet theory. In one instance, to the moderate use of alcohol; in another, to the abstinence; in another to its frequent use. One to the fact that he has never smoked, and another to the fact that he has, giving him mental relaxation, as well as stimulation of the intestinal tract. There are many peculiar and individual diets, such as a one-type diet, infrequent eating, frequent eating of small meals, this or that particular kind of food, and other rational or irrational theories; but in the final analysis it is probable that most people who live to old age have come from long-lived families. This tendency may be modified, of course, by indiscretions of diet, mental activity, or physical work, but the essential is that we find in certain families a tendency to live long extending through many generations, just as in others we see the contrary. It is probable, therefore, that the first requisite for longevity is to be born with such a tendency.

Moderation is the key-note of dieting in old age, and I quote the following from Osler as probably best expressing the attitude we should assume in this period of life:

"The famous George Cheyne, a man of enormous bulk, reduced himself by dieting from 448 lbs. to proper dimensions. One of his aphorisms says, 'Every wise man after fifty-eight ought to begin to lessen at least the quantity of his aliment; and if he would continue free from great and dangerous distempers, and preserve his senses and faculties clear to the last, he ought every seven years to go on abating gradually and sensibly, and at last descend out of life as he ascended into it, even into a child's diet. Put in other words, it reads, 'after fifty years of age we eat too much.'"

I have in mind two brothers, one ninety-two and the other ninety-eight. The elder ascribes his age to the fact

that he has been a very frugal and simple eater, never taking more than two meals a day, and frequently only one. In addition to this he abstains totally from alcohol and tobacco, and is convinced that he can live for an indefinite period. The younger brother, who at ninety-two has lived generously, over-eaten, and used alcohol freely, thinks in turn that he has been able to maintain his health and strength because of the food and alcohol he has consumed. It again but illustrates the fact that as we get older everyone has a pet theory to account for his living to old age. The investigation in this particular instance revealed that the father of these two men died at ninety-eight, and that his ancestors before him were very long-lived.

Closely associated and directly related to the question of diet is that of relaxation in old age. By relaxation I do not merely mean sleep, in fact old people require less sleep as a rule, but ability to relax mentally and physically can be cultivated as a habit. It must be done systematically and if properly carried out will greatly facilitate and aid diet in prolonging life. I have in mind an individual who in middle life was condemned to short life and sure death, due to over-eating, over-work, and many other over-activities. He is now eighty-seven years of age, and his good health, in my opinion, is largely due to the fact that he was able to teach himself to relax. From four to six o'clock every afternoon he goes to his room, and no communication of any kind can be had with him, either by telephone or message. He is entirely out so far as every activity is concerned, and knows that he is not to be disturbed. He does not sleep, but has developed the art of physical relaxation to its maximum. At the end of his period of rest he is almost rejuvenated. He has carried out this plan through many years, and in spite of the fact that he is rather a generous eater and smokes immoderately, he is an active old man and thoroughly enjoys life. Incidentally at eighty-seven he made two trips to Europe this summer, which is his custom, returning to New York about the first of August because he says that "in England they do not know how to cut hair," immediately sailing again to com-

plete his summer vacation abroad. It is easy to see from the above facts that he is a man of many theories, but the practical point is the fact that he has learned to relax, and this associated with a perfect digestion, has made him a happy old man.

The question of alcohol is important, and whether it has any food value or is purely a stimulant has been often discussed. It is not necessary to go into this controversy, and I am only expressing my own personal views in saying that I am very sure that alcohol in moderation is most useful for people after sixty years of age, or for those even younger if old age is premature. It is a pleasant, quick stimulant, and even if devoid of food value, which is debatable, aids digestion, picks up the circulation, stimulates the cerebrum, and makes the picture prettier and the day shorter. This in itself seems to be of great value for those in the latter stages of life.

In arranging diets we must distinguish between the individual who is old in point of years, and the one who is physiologically old; who in other words has acquired his old age from dissipation, excessive work, bad hygiene, etc., and thereby becomes old prematurely. It is necessary to give a higher protein diet to this second type than to those normally old, since protein is necessary for the cell repair; and the mistake of classing all these cases under one head is often made. While for ordinary old age protein may be cut very low, in the latter type, due to depletion, at least three calories per pound of body weight are needed against the one and one-half sufficient for the true old age types.

People who desire to prolong life through food regulation should begin with the careful construction of balanced diet in middle life, gradually cutting down the protein as they advance in years, but maintaining the balance always. While there may be exceptions, the evidence is all in favor of properly balanced mixed diet throughout life. Starting during the period of activity with a considerable factor of protein, carbohydrates and mineral

salts, the first two should be gradually decreased, but in a logical manner.

Starvation should be avoided, and it seems that many people would be much happier if they could be prevented from punishing themselves with the many unabridged theories that are so much in evidence. It should be remembered, however, that if an individual has established a diet for himself through experience and study which has satisfied his requirements over a period of years, it is best not to disturb or change his habits even though we may feel that they are scientifically incorrect. Sudden modifications are apt to be disastrous in this period of life. It is quite essential that regularity be stressed in the feeding of old people; and if they are underweight, frequent eating in small quantities is advisable. Without any doubt milk, or milk products, are the most satisfactory foods for old people that we have, for they contain all the elements of food, and are most easily digested. Metchnekoff's work with his sour milk, while it was a disappointment to him in as much as it was not a panacea for old age, and did not prolong life indefinitely, as he had hoped, undoubtedly has much merit. The more recent modification with the acidophilus, the advocacy of the sour goat's milk, with many other products of this kind, form a type of diet that is distinctly beneficial for many people.

A mixed diet in proper proportions is probably without question most sane and efficient on the average. Fruit, eggs, fish and vegetables, with the exception of peas, beans and cabbage, unpolished rice, sage, arrow-root, tapioca and bread puddings are easily digested. Rice puddings and pastries should be avoided. Cooked or fresh fruits may be taken freely, as they contain many of the salts necessary for life and are free from the toxic effects of protein. This element of the diet, to my mind, is not utilized sufficiently by old people.

There are many differences of opinion regarding the proper number of calories necessary in old age. Roughly speaking, from 1300 to 1500 a day should suffice, while

50 grams of protein, 120 of carbohydrates, and 30 to 40 of fats, are about average; yet this differs again with the individual. When a stage is reached where teeth have been removed, protein must be cut down because of the inability to masticate, but this loss of protein may be equalized by an increase of milk and eggs.

A further serious problem of old age is over-eating, which in many instances is more habit than a desire for food, since the sense of taste is greatly diminished at this time, and large amounts of salt or seasoning are often required to make food palatable. Tendencies toward retention diseases, such as gout, rheumatism, kidney deficiency, high blood pressure, and such conditions are easily developed from this source. We must remember that not only is less energy needed, but there is a deficiency in function and cell activity which prevents proper elimination, and therefore indiscretions in feeding, cause accumulations even with relatively small quantities of food. The best results are usually obtained when the day is divided into periods of three hours so that five or six small meals are taken.

Reverting again to the question of alcohol, it is my belief that beers and malt liquors have a decided food value in old age, and that small quantities of sherry, port, claret or sautern at meal times aid decidedly in stimulating gastric digestion.

We are also often forced to counteract the tendency of old people to refuse vegetables; the reason usually given being that they produce flatulence. If properly cooked and slowly eaten, however, this objection may be largely overcome, or if necessary artificial digestants such as pepsin and hydrochloric acid may be added, for moderate consumption of such foods at this time of life is generally advisable.

There is a close relationship, too, between sleep and feeding in old age, and it is essential that ample sleep be obtained. It is often necessary to give a glass of hot milk or

vichy and milk, or a little hot liquid food of some kind at bed time in order to induce proper relaxation. If there is any tendency on the part of age to develop obesity, the diet should be modified before this becomes burdensome. On the other hand, any tendency to lose weight should be watched for with equal care, and the quality of diet altered as the case demands. In other words, maintain a balance in which neither excessive gain nor excessive loss becomes a factor.

Great care should be observed to correct any tendency for constipation, which in the main would probably be due to a poor muscle tone. At the same time its presence accelerates the tendency to putrefaction in the intestinal tract and produces a retention toxemia which may become a matter of some seriousness if it is not corrected.

Whenever possible the noon meal should be the main meal for old people, and a positive prohibition should be placed on any exercise immediately after meals. There is a tendency for older people, particularly men, as a result of a sense of vanity, to endeavor to display their physical powers; I am especially referring to golf, and there have been a number of disasters as a result when this exercise is taken immediately after meals.

If there is any tendency to hypertension a chemical study of the blood should be made, and a restriction or practical elimination of the sodium chloride from the diet.

Many diets have been arranged for old people, but I know of nothing better on the subject than a quotation from Doctor George S. Keith's "Fads of an Old Physician," which was written in his seventy-eighth year, and is as follows:

For breakfast I have a large cup of tea, with milk or cream; brown bread from two to three ounces; and usually one and a half ounces of fish, or half that quantity, and that very rarely, of bacon. Sometimes for a few days I take a cup of coffee with half milk, but no fish or bacon. Lunch is a cup of cocoa or chocolate, if the weather be

cold; and if it is warm, a small tumbler of milk, about six ounces, with the same quantity of bread as at breakfast. At both meals I use butter, not a quarter of an ounce, and quite as much jelly as marmalade. This is my usual lunch, but occasionally instead of cocoa I have a baked apple, or some prunes with milk, or strawberries with cream so long as I can get them, or, very rarely, vegetable soup. When I have no milk I usually take a morsel (not half an ounce) of cheese. At 4 P.M. a small cup of tea, and sometimes biscuit or cake. For dinner, at 7, which is my chief meal, I have soup, from peas, lentils, potatoes, celery, carrots, etc., the first two made with no meat stock, and the others with a little from lamb or a bone; or fish soup, the only animal soup I indulge in. Fish, mostly white deep-sea fish direct from Montrose; of this I take no more than three ounces, with a potato and always another vegetable fresh from the garden. If there is no fish, I may take once or twice a week an ounce or two, certainly not more, of lamb, game, rabbit or tripe; but often I have neither fish nor flesh. The dinner ends with stewed fruit with cream, or pudding or fruit tart; of these I take a fair helping. During the winter season, instead of fruit or pudding, I often have celery, with cheese, oatcake and butter. On this diet I enjoy the best of health, and for my age am up to a fair amount of exercise, walking three to six miles daily in good and sometimes bad weather, and usually part of this is up a steep road with a rise of 250 feet. The only confession I have to make is that when at home I do not rise till I have had breakfast and read the newspaper. This is a habit I have recommended to many approaching my own age, and those who have tried it admit that they are stronger for the rest of the day. I enjoy breakfast just as much as any other meal, though I never feel what can be called hunger, and have not done so for many years. I could omit a meal at any time without discomfort. This I have long looked upon as the best proof of perfect digestion. During very warm months I take rather less bread and butter, and I do not try to make this up by taking anything else."

In conclusion, therefore, let me repeat, that although the most general causes of extended life are undoubtedly hereditary, much comfort and physical well-being may be gained by old people if they will moderate and take heed to their eating habits; which advantages in helping to sustain life must obviously protract it. The diet of old age, therefore, should be mixed, simple, small in quantity, and there should be frequent feedings, up to five or six a day. Emphasis should be laid on the fruit and vegetable factors, and great care taken to prevent accumulation and retention, especially of protein, for nourishment is always concerned as much with output as input. In addition, habit should be studied carefully in regulating or prescribing any diet for a person of advanced years; since it is well to remember that foods that are palatable to a man will generally be more easily digested and nourish him more than those of greater potential value, eaten without relish; and the habit of relaxation should be cultivated as an adjuvant of diet. In addition as previously stated, I personally consider alcohol in the form of beer or malt liquors to have a distinct food value.

PHARMACOLOGY IN OLD AGE [1]

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To be asked to discuss the pharmacology of old age seems to be at first thought, as broadly indefinite as if one were handed the pharmacopeia, and was asked what was in it.

Even with all the drugs at our disposal, however, the existence of old age strongly limits us in many ways. Age, like childhood, requires in general a diminution of the dosage to be given of any individual drug, as some drugs, such as morphine and belladonna, or even digitalis are definitely not as well borne, while others are much better

[1] Delivered October 4, 1928.