ALCOHOL AND THE FATS IN THE TREATMENT OF PHTHISIS.

[From a Clinical Lecture by P. H. Cronin, Ph.D., A.M., M.D., one of the attending Physicians of Cook County Hospital.]

REPORTED BY J. K. SUTTON, M.S.

It has been said by a well-known authority on the subject of phthisis, that there is nothing in the whole range of medical science, which the student ought to study more carefully than the cachexia, or special form of ill health, associated with the occurrence of tubercle and general scrofulous affections. Indeed, it may be said that in every phase of his professional career, a knowledge of the pathology of scrofula, in its general or special aspect, is an absolute necessity.

Experience has fully demonstrated that not to causes within the province of the medical man, solely, can the origin of tubercle or the scrofulous diathesis be traced. Yet it must be acknowledged that by the confidence naturally acquired by him, as the trusted friend of the most exclusive families, he may exercise a potent influence for good in teaching how the public may control the inroads of consumption, by prudent marriages, sanitary attention to offspring, and the absolute need of fresh air, with freest ventilation, in the dwellings of rich and poor alike. In short, it is by the mode of life as citizens of the world; in the social relations of husbands and wives, parents and children, as well as in the public relations of teachers and pupils, masters and workmen, that the extent and ravages of consumption can best be controlled.

But all of this, at which I have merely hinted, is for your future study, and since the tendency of modern medicine is to "throw physic to the dogs," in so far as its practice extended in the days of our fathers, I doubt not that the majority of you will devoutly kneel at the shrine of the goddess Hygeia and pay homage to that growing sentiment in the profession in favor of general sanitation, as influencing the preservation of the highest standard of physical well-being.

The cases before us to-day clearly demonstrate that phthisis is truly, as its name implies, a wasting disease. The wan features, the sunken eyes, the shriveled skin, and general emaciation are the most eloquent exponents of poor nutrition and malassimilation, and since this bodily condition calls for a remedy, it might be well to study as briefly as the sequence will permit, the causation of phthisis, before entering upon its treatment.

That phthisis is a constitutional disease, goes for the saying. It is characterized by lesions commencing with induration of a lobe or lobule of the lungs, ending in the disintegration of the new material and of the structures involved in this induration; the formation of cavities, and the accumulation and constant discharge of purulent secretion, with or without miliary tubercle. Constitutionally, the result is the deposit of a soft, unorganized matter, white or pale yellow in color, firm, somewhat resembling curd or soft new cheese, though less tough, sometimes

granular and friable, and consisting largely of albuminous material. It is often found associated with a purulent-like fluid, and is frequently to be met with in rounded masses varying from the size of a millet seed to that of a hen's egg, or larger. This material may be enclosed in cysts or simply deposited within the natural canals of the body, or it may be diffused, as if by infiltration, through the textures of the various structures. To the rounded masses is given the name of tubercle, and the material itself has obtained the name of scrofulous or tuberculous matter.

The disease manifests a remarkable tendency to certain specific forms of nutritive disorders, which ultimately lead to extreme wasting of the systemic structures. Indeed, it would seem as though the vital forces were incapable of completing tissue organization, owing to the constant accumulation of systemic debris, acting as a hindrance to repair of the waste resulting from tissue metamorphosis. That such is really the case I need not tell you. It is known that the venous radicles and lymphatics serve to build or renew tissue, as well as to act the part of scavengers for the organism by the removal of effete material. Now, when the scale of nutrition is below par, whether as the result of actual want of food or improper assimilation, the function of repair is necessarily arrested, while destruction or consumption goes on with even more than wonted vigor. Soon this want of balance in the nutritive function manifests itself, in hectic and the accompanying structural changes so familiar to all of you.

As regards loss of weight, it is astonishing to note to what an extent bodily waste may go on without extinguishing the lamp of life. Chossat, in his "*Recherches experimentales sur l'inanition*," has shown that the average loss of weight occurring in healthy, warm-blooded animals, between the commencement of starvation and death, is 40 per cent. In other words, an animal without the intervention of disease, dies when it has lost two-thirds of its body weight. Dr. Tanner is said to have lost one pound daily during his noted fast. The researches of Chossat possess for us the additional interest of locating the loss sustained by the different tissues of the body. Thus, fatty tissue almost wholly disappears, 93½ per cent. going to waste. The blood loses 75 per cent., the spleen 71 per cent., and the pancreas 64 per cent. of their substance. The muscles of locomotion show a loss of 42½ per cent., while the nervous system exhibits a waste of less than two per cent.

As in starvation, *per se*, so in the quite as effective starvation of phthisis. Indeed, the tissue waste, if we except that of the pulmonary organs, noted in consumption, bears a striking analogy to the structural loss so manifest in ordinary inanition. It is evident that the atrophy of the pancreas, so well marked a feature in phthisis, must lead to imperfect preparation of fatty material for assimilation. This soon reduces the needed supply of adipose tissue to a minimum. The spleen fails in its wonted action, and the blood itself becoming lessened in quantity, necessarily embarrasses the lungs and heart and kidneys. The nervous tissue alone preserves a nearly wonted vigor. Indeed, it is remarkable, that the

mental faculties remain intact, excepting that the effect of the disease upon the mind is such as often to impair the ability to realize the extent of a serious affection.

In view of the fact that the body requires thirteen times more carbonaceous than nitrogenous food, for its sustenance, the daily consumption of carbon being 4,000 grains, that of nitrogen about 300 grains, the prime indication for treatment of a disease characterized by so large a percentage of waste of carbon as is manifest in phthisis, is a plentiful supply of easily combustible material. Such a material we have in alcohol, freed from the impurity of fusel oil, which latter is of slow oxidizable power and absolutely poisonous.

Experiment has shown that the combustion of one gramme of pure alcohol raises the temperature of seven liters of water one degree Centigrade. Cod-liver oil, in the same quantity, brings to a like degree of temperature nine liters. Hence, the relative heat-producing powers of alcohol, and the well-known nutrient oil are, as say, three to four. Calculated on the above basis, three and one-half ounces of cod-liver oil suffices to maintain one-third of the body heat for twenty-four hours, while about four ounces of alcohol, or about the quantity contained in a liter of light wine, serves the same purpose. There is this difference, however, between the two forms of nourishment. The oil, if tolerated, is decidedly curative, and thus becomes a positive benefit throughout the life of the individual using it. Not so with the use of alcohol, for in the majority of cases the cure is quite as bad as the disease, physically, and not infrequently leaves the patient a moral wreck.

The fats then, chief among which is cod-liver oil, form the main-stay of rational treatment of phthisis. But in the case of this highly-prized remedy we meet with an obstacle at the very door of promised relief. For, if cod-liver oil be nauseating to one in vigorous health, it is positively disgusting to a phthisical patient. Then, too, the system of such a patient is illy-prepared to assimilate the raw oil, and with food within easy reach of him he may die.

Here, however, the chemist and skillful pharmacist come to the relief of physician and patient alike. Nature's methods are studied, the wasted pancreas is assisted by the rest afforded by emulsionized oil. The administration of nutrient salts, as the phosphates of lime and magnesia, give needed energy to the venules and lymphatics, the blood is enriched by the assimilation of milk and other well-balanced foods, while the various symptomatic manifestations, such as cough, night sweats, dyspepsia, hæmorrhage, and general nervous unrest, yield to systemic or special treatment, and finally God's air and sunshine thrown around all, the hope grows stronger daily that the energizing hand of nature may assist our own in leading our patient to renewed life and happiness.

PROFESSOR D. W. YANDELL, OF LOUISVILLE.—We regret to learn that this distinguished member of the profession, after suffering several weeks of confinement with rheumatism, has been obliged to visit Florida in the hope of a more perfect recovery.

MEDICAL PROGRESS.

MATERIA MEDICA AND THERAPEUTICS.

THE BEST TIME FOR ADMINISTERING MEDICINES.—*The Midland Medical Miscellany* has an excellent article on this subject, in which it answers the question: Before or after meals? Such is the question often asked of the doctor, but the answer is not always ready. Medicines that are irritating should be given after meals, when the stomach is full, viz.: the salts of copper, zinc, iron and arsenic, in large doses. Small doses, intended to act on the stomach terminals of the vagi, must be given when the organ is empty. Chemical reasons also have their influence, thus, oxide and nitrate of silver, intended for local action, should appear in the stomach during its period of inactivity, lest, at other times, chemical reactions destroy the special attributes for which these remedies are prescribed. Iodine and the iodides further illustrate this point. Given on an empty stomach they promptly diffuse into the blood, but if digestion is going on, the acids and starch form products of inferior activity, and thus the purpose which they were intended to subserve is defeated. Substances prescribed to have alveal action on the mucous membrane, or for prompt diffusion unaltered, are preferably given before meals. The condition of the stomach veins after meals is such as to lessen the activity of diffusion of poisons, and hinders their passage through the liver. It follows that active medicaments in doses near the danger-line, are more safely administered after meals.

When shall acids and alkalies be given, before or after meals? First, as to acids. When acids are prescribed with the view to check the excessive formation of the acids of the gastric juice, they may be given before meals—as, by the laws of osmosis, they will determine the glandular flow of the alkaline constituents of the blood. The same reasoning would hold good when the alkaline condition of the blood was in excess; osmosis being favored, the acid would reach the blood more readily. Second, as to alkalies. These may be given just before meals, when the acid forming materials in the blood diffuse into the stomach glands, and after digestion is completed, when the alkalies diffuse directly into the blood, without interference from the contents of the stomach. An alkali taken during the time when the reaction of the stomach juices should be strongly acid, must necessarily hinder, if not arrest, the digestive process for the time being. The metallic salts—notably corrosive sublimate, alcohol, tannin, and some other agents—impair or destroy the ferment, or digestive power, of pepsin. Wine that is intended to act as a food, is most beneficial when taken slowly during the course of the meal. The objection as regards the ill effect of alcohol on pepsin, is not applicable here, except to the stronger spirituous wines in large quantities, for the ordinary medicinal wines do not have sufficient alcoholic strength to injure this ferment. Iron, phosphates, cod-liver oil, malt, and similar agents should, as a rule, go with food through