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The Prophylactic Aspects of Medical Studies[1]

BY HARVEY W. WILEY, WASHINGTON, D. C.

On an occasion like that of today when a number of young men who have been trained in the theory of medicine are about to enter upon its practice, it may be profitable to view from the position of an outsider, and yet one who is vitally interested in the profession, some of the present aspects of medicine. In treating of these aspects I do not do so either from the point of view of the specialist in medicine nor as a hygienist, but from that of the public more or less instructed in the supposed mysteries of medical science. The relation of the profession to the public, just as much as of the members of the profession to each other, demands special consideration.

In this light it is seen at once that the physician plays two distinct and equally important rôles. He by common consent is made the guardian of the public health, and he is the one, when the individual's health has been impaired, who is called upon to restore the patient to his former condition.

It is particularly from the first point of view that I desire to direct my remarks today. The physician is the guardian of the public health in the sense that it is a part of his duty as a professional man and as a physician to see to it that the causes which produce disease are as fully eliminated as possible from active

[1] Address to the Graduating Class of the School of Medicine of the University of Nebraska, May 21, 1908.

influence upon the public at large. In other words, the great principles of sanitation are those with which the medical fraternity is particularly concerned. Sanitation relates first of all to supplying in a state of purity those necessities of life without which it can not be maintained even for a short time in a safe and serviceable state. The three great necessities of life which are absolutely insistent in their demands and which must be constantly provided are air, water, and food. To the consideration of these great bases of vitality the medical profession must give its careful and continual attention.

The problem of fresh air is not only one of hygiene, but also of engineering, and it is unfortunate that in the development of architecture so little attention has been paid to the vital problem of ventilation. It is strange in this modern day to see so many buildings in which are herded the human race from early childhood, viz., the schoolhouse, the church, the court room, the theater and the lecture room, which have been erected with so little regard for the supply of pure air.

I would not for a moment decry that one great purpose of architecture, viz., beauty and proportion. The existence of a fine building from an architectural and esthetic point of view is a constant education, imbuing the whole community, even unconsciously, with correct ideas of art and esthetics. I should for one not ask that a single feature of architectural beauty be sacrificed in the erection of our public buildings, but I believe that the true principles of ventilation and the furnishing of pure air to the occupants of our buildings need not interfere with the beauty either of the exterior or the interior of the structure.

This idea of pure air should be carried especially into the homes, where so often the sleeping rooms are devoid of proper ventilation facilities, and those that are present are kept in a state of "innocuous desuetude." Somehow or other our people have an idea, especially in reference to bedrooms, that fresh air is a kind of insidious poison. How often have we heard mothers caution their children to beware of the night air! The open window, the ventilating flue, and the well-drawing chimney should be carefully provided in every living room and every bedchamber of the house.

Much has been said in modern literature respecting the curative effects of fresh air in certain forms of insidious disease, such as, for instance, tuberculosis. Much more may be said in praise of the prophylactic properties of fresh air, which tend to strengthen the body and keep the blood aerated, and thus ward off disease.

The common kind of carpets and of sweeping does much to fill the air with particles of matter, minute in size and yet capable of collecting upon the mucuous membrane and causing trouble. Any one who has such an unfortunate habit as to still be in bed on a bright morning when the rays of the sun are horizontal may see thousands of particles of matter floating in the air. I do not call attention to this with any idea that the air in general is free from dust, because such is not the case. It is well known that even the purest air at very remote distances from the earth's surface carries innumerable particles of dust, but those that come from the sweeping of carpets are much more to be feared in their deleterious effects than those which are found in the open, so if we must breathe dust and dirt let it be that of the open rather than that of the closed bedroom. The dust of the bedroom with its accumulation of the excretory products of respiration renders it unfit for further breathing. It is true that no one can expect to breathe air that has not been breathed by any other person, but we can expect a reasonable supply of outdoor air admixed therewith.

The medical profession should use its influence in modifying the architecture of the future so as to secure good sanitary habitations for all.

The relations of the medical profession to the water supply are so well known and have been so fully developed that little attention need be called to them at the present time. In this particular community perhaps the principal problem in connection with the water service is the elimination of silt. This is perhaps more important from the ocular point of view than from the digestive, because in this wide country where habitations are infrequent and the population is sparse the soil is reasonably pure. If the old adage be true that every one must eat a peck of dirt during his life, however, I fear that the activity of the human race in this instance would be somewhat limited by a too early compliance with the rule. At any rate, removal of the silt is demanded

by all consumers. I will not waste any time on this occasion with a description of the various forms of filtration proposed and in operation for this purpose. I only call attention to this peculiar case where the silt is so fine and its colloidal nature so perfect that it is separated with great difficulty by any kind of a filter. In these cases it seems necessary that some electrolyte be used, because it appears from the researches of chemists that the colloidal suspension of silt is due to a certain electrical charge, and when this electricity is discharged by means of an electrolyte, coagulation of the silt takes place and its separation by filtration is easily accomplished. The best of the electrolytes are those substances such as alum, iron and copper sulphates, usually combined with lime, which are commonly adjudged to be injurious and which should not be introduced into the human organism. It is, therefore, one of the duties of the medical profession to see to it that when chemical coagulation is practised previous to filtration of a water supply, it should be so conducted and so controlled that none of the reagents used for the production of coagulation be found in solution in the clear filtered product.

The preservation of the source of supply of the water from contamination, especially with pathogenic germs, is also a problem of equal importance. It is the duty of every community to so safeguard its water supply as to avoid the dangers of epidemic diseases due to the contamination of the supply itself. So well has this principle been recognized that many of the important cities of the country have expended millions of dollars in securing from uncontaminated sources a wholesome supply of water. But even in these cases filtration should rarely be neglected since unexpected sources of contamination often occur, and it is well known that a good filtration, especially the best of the sand filtrations, removes practically all the organisms, both good and bad, from the water. Inasmuch as the bad organisms are always immensely inferior in number to the good, the doctrine of probabilities shows that where good filtration is secured, leaving only from ten to twenty organisms per cubic centimeter, the danger of contamination from pathogenic germs is always reduced to a vanishing quantity.

Quite as important as the water supply is the disposal of the sewage of the densely populated communities. I think the med-

ical profession must set its face against the old-fashioned method of dumping the sewage into the running streams, thus contaminating the waters of all living below these sources. No difference how great the magnitude of the water current may be, there must be danger of contamination for a given time, for it takes several hours and sometimes longer for the contaminated water to be purified by the action of its own nitrifying organisms, and even in those cases the pathogenic germs may sometimes escape destruction. I believe it will be necessary in the future that the great cities, and the small towns, too, for that matter, make some arrangements for the disposal of their sewage by pumping it back upon the land. This, of course, is easily accomplished with a reasonably level country and one of a sandy character. It is far more difficult of accomplishment in the case of cities situated in valleys where the amount of low lands available for the disposal of sewage is limited in quantity. The condition of the city of New York at this time in regard to the disposal of its sewage and garbage is one of interest. The sewage of New York is poured either into the Hudson or the East river. The board of health has condemned as unsuitable for consumption the oyster beds lying in the immediate vicinity of New York city and its harbors. These vast beds of oysters, so valuable as a food product and so much prized by the gourmet, are now practically forbidden sale, and can only be utilized under inspection of sanitary officers. The problem is more an engineering than a chemical one, and yet it must be thru the agitation and influence of the members of the medical profession that the proper engineering schemes be introduced and operated to free the country of the danger that is imminent from the present methods of disposing of sewage.

The third interest of life which I mention as one that particularly concerns the physician is the food supply. This is part of the problem which it has been my fortune, good or bad, to have studied more than all the others, and one which, therefore, I speak of with all the greater diffidence. It seems that it is unfortunate and yet it is fortunate that the more one studies a subject of the importance of this one, the less he feels himself qualified to utter dicta concerning it. But I feel that I must, at least, make a passing notice of the importance of the food supply in its relations to the public health. I shall not mention that other,

perhaps more important, aspect of the question, namely, the relations of the food supply to fraud and deception. That the health of the community depends largely upon the character of the food is admitted by all. Nutrition is not only a matter of quantity but also of quality. The greatest abundance of spoiled food would not be suitable for the sustenance of life, and yet life may be sustained for a time upon almost incredibly small quantities of pure food. I mean by the word "pure" applied to food products in this sense an article of diet which is either in its natural state, or, if modified by man, has not had its valuable ingredients abstracted nor has had added to it any injurious or harmful ingredient. In this great country of ours where the production of food is one of the chief industries, the problem of its conservation and transportation is one of more than usual interest. We not only must distribute foods to our own people, especially in the great crowded centers, but we must also supply the demand of foreign countries, in so far as possible for our food products. Thus the preparation of food products for transportation is a legitimate industry of the greatest significance to our prosperity. My own work in this matter has been confined largely to the study of the processes of preserving foods by chemical means, that is, by means of drugs and chemicals which have no condimental value, have practically no odor and very little taste, and which, therefore, may be added to food products without appreciable effect on their palatability or general flavor.

The methods of preserving foods for transportation are well known. Many food products, like the cereal grains, require no special means of preservation, except to be kept properly dry and ventilated. In this condition, if the infection of insects is avoided, cereal grains are kept for an indefinite time without appreciable deterioration. But most of the other food products, such as meats, vegetables, butter, and milk are of a more perishable nature, and unless certain precautions are observed they will not bear keeping for any length of time when transported to any great distance. In order that these food products may be conserved, certain well-known and unobjectionable processes are practiced. I may mention among these cold storage, desiccation, and sterilization. It is well known that when a food product which tends naturally to decay is reduced to a temperature below

freezing point the progress of fermentation and decay is arrested with more or less completeness. In this condition the food product will keep a reasonable length of time with no appreciable deterioration. In fact, some food products are considered by connoisseurs to improve for a time by storage. Such products are fruits harvested before they are ripe, meats of certain kinds, both fresh and preserved, etc. Other products which may be kept in cold storage and which do not improve are dairy products of all kinds, fish and eggs, and yet these products may be kept for a reasonable length of time without undergoing any marked deterioration, and, therefore, refrigeration becomes a most valuable and indispensable aid for the preservation and transportation of foods. When practiced under proper control and within proper limits of time it can only be commended as one of the blessings of humanity. The drying of food products which otherwise would rapidly decay is also a legitimate practice which is exercised in many products, such as meats, fruits, and vegetables. The sterilization of food products by the application of heat, or the pasteurization thereof by a lower degree of heat, is one of the most important and useful methods of preserving food products. Organic bodies which are sterilized in this way, or pasteurized, do not undergo decay unless reinfected or reimpregnated with the germs, because decay is conditioned chiefly by the activity of certain bacteria and enzymes which are found in all foods in a natural state. The great canning industry of the country is an evidence of the magnitude of the processes of sterilization and pasteurization. When conducted under proper control this method of preserving fruits is not open to any objection. The preserving of foods, however, *vi et armis,* that is, by means of tasteless and odorless chemicals, is quite a different proposition. Here a body must be added to the food which itself has the power of destroying, or at least paralyzing, the bacteria and other ferments which cause decay. I believe I may safely say to the members of the medical profession today that this method of preserving foods is almost universally condemned by our fraternity. Experience has shown in the first place that these methods of preserving are unnecessary, and experiment has shown further that the bodies themselves are of a character which can not fail to produce injurious results. Being drugs, they can only act as

drugs, and while they might be useful in cases of disturbed conditions of health, they certainly can not be recommended in a state of ordinary health. Investigations which I have made, as well as those which have been made by others, show unmistakable changes in the metabolism of an injurious character, and the production of medical and clinical symptoms show disturbances of a very serious nature in the ordinary functions of the body. Moreover, these bodies are excreted chiefly thru the cells of the kidney, and many of them are of a nature inducing specific organic changes which sooner or later lead to grave lesions destructive of tissues and of health. I believe, therefore, it is the duty of the medical fraternity to stand with a solid front in opposition to the methods of preserving foods by the addition of chemicals of this character.

There is generally a mistaken idea in regard to adulterated or impure foods in that they are associated with effects of a violent and well-marked character, producing sudden illness of a severe type and even with a fatal result. I do not seek to minimize the dangers which lurk in foods of this kind, but call attention particularly to the fact that these dangers are very rarely met; with the exception of the development of ptomaines in foods, producing a poisonous effect, there are very few cases on record of fatal illness due directly to the administration of adulterated foods. The dangers in impure and adulterated foods are of a different character. The effects which they produce are slight and their harmful results are insidious. The administration of a food which is adulterated or impure, while not often producing sudden and serious illness, tends rather to gradually undermine the vitality of the system and its power of resistance to disease by the production of a succession of small effects, disturbing metabolism and finally affecting the health of the principal organs of the body. These effects are of such a character in foods as to be traced with great difficulty, and are usually entirely overlooked when the physician comes to make his diagnosis. The disease from which the patient is suffering at such a time is usually one which the diagnostician would hardly attribute to long years of use of deleterious food products. I refer particularly to the substances which are added to foods rather than to lack of care in the preparation and handling of foods, resulting in

putrefaction and its necessarily dangerous and concomitant results. Nearly all the substances which are added to foods in the form of preservatives, or coloring matters, are those which have no food value, undergo little or no change in the system, and are excreted in practically the same form in which they are ingested. These bodies necessarily are very poisonous to the cells, especially the protoplasm of the cells, else they would not affect those organisms in foods which produce fermentation and decay. Since in the excretion of these bodies they must ultimately come in contact with the protoplasm thru the cells of the organs, it is theoretically certain that these cells must be injured to a greater or less extent. This theory is borne out by practical histological examinations of the lower animals which have been fed for a length of time on the ordinary chemical preservatives. In such cases the kidneys especially have been found suffering from this change, undoubtedly caused by the long administration of these chemicals. Even in small quantities, therefore, these preservatives must be looked upon as of a harmful character, gradually sapping the vitality of the body by deranging the functions of those organs particularly charged with getting rid of the katabolic products of the body, together with substances which are wholly non-metabolized as in the case of the preservatives and coloring matters above alluded to. The point which is especially emphasized in this case is the offense against hygiene and health in adding to food products any of these extraneous bodies which can not possibly do any good and which must certainly in the long run do harm.

The adulteration and misbranding of drugs leads to results of the gravest character in actual therapeutics. Assuming, as we do, not only from a sense of conviction, but also for the sake of the argument, that drugs have actual therapeutic value, this value must be associated with their actual properties. Substitution of one drug for another, therefore, robs the physician of his armament and injures the patient by depriving him of the remedy which the physician supposes he has administered. If the adulteration of foods which are taken usually in a state of health is reprehensible, what must we say of the adulteration of products which are to be administered at vital crises where the life of the patient is hanging in the balance? In one respect it seems to me

our national food and drugs act is very much at fault in this matter, namely, in admitting into interstate commerce drug products which are not of the standard strength and purity prescribed by the pharmacopoeia, provided their actual strength and purity are named upon the label. These drugs which are not of actual strength and purity, according to the pharmacopoeia, may pass freely into interstate commerce if labeled so as to show their variation from the standard. When such products enter into manufacture within a state they may be exposed for sale at all the drug stores without their standard of strength having been written upon them. Hence, the consumer, that is the patient, may often be the recipient of drug products under pharmacopoeial names which do not conform to pharmacopoeial purity and strength. This condition of affairs could, of course, be remedied by state legislation which would require drug stores within the state to sell only in standard prescriptions articles of pharmacopoeial purity and strength. This fault is one which doubtless will be remedied in the future if its evil effects as above indicated can be clearly demonstrated.

The final effect upon the public health of purity of foods and drugs, it seems to me, is a matter of no doubt. I am confident the pure food and drugs law will tend, first, to ward off disease, and, second, to effect its more speedy cure, thus not only increasing the happiness of human life but also prolonging it.

Another important way in which disease may be prevented is found in the quarantine system. Practically every civilized country at the present time recognizes the value of quarantine and also legalizes its practice. The principle of the quarantine is applied in several ways. First, attention may be called to the quarantine against disease coming from foreign countries. It is by a rigid application of this principle that such epidemic diseases as cholera and yellow fever are excluded. It is, I believe, pretty well established that neither one of these diseases is indigenous to the United States. In the case of cholera the nature of the germ or enzyme which produces it is not well understood. That it is carried, however, in some way in the water, or the food, or the air is quite certain since it can hardly be regarded as a contagious disease in the ordinary sense of that term. In the case of the other disease mentioned, however, the method of infection

has been definitely determined. A certain species of mosquito known as *stegomyia* has the property of itself becoming infected with this disease when it feeds upon an infected patient, and thus of transmitting it to other people on which the infected insect may feed. While it would be advisable, if possible, to exterminate this species of mosquito, that is hardly regarded at the present time as a possible contingency. The next best thing is to prevent the mosquito itself from becoming infected. Thus arises the principle of quarantine against foreign countries from which the disease may be imported. So thoroly established is the quarantine at the present time that no foreign vessel is allowed to discharge its cargo or its passengers within the territory of the United States without first undergoing inspection by health officers. This method of quarantine often imposes hardships upon innocent persons, since if one of the passengers of the ship be infected with a contagious or epidemic disease all others are required to be quarantined until the danger of the development of the disease is past.

The second, and more common principle of quarantine, is isolation. This principle is practiced in all cities at the present time where such diseases as smallpox, scarlet fever, whooping cough, and measles are restricted by isolation. In the case of smallpox particularly the patient is isolated in a special hospital provided for the purpose, while in the case of the other diseases the isolation usually takes place at the home of the patient. In whatever way, however, the isolation is established it is recognized as an application of the principle of quarantine. The efficiency of this system of isolation was well illustrated two years ago during the outbreak of yellow fever in New Orleans. By a combination of an attack upon the mosquito and by the isolation of the patients, the disease was confined to a very restricted portion of the city, and disappeared long before the proverbial frost, which during previous attacks was regarded as the sole efficacious measure for the destruction of the disease.

The question of quarantine is now broadening along many lines with a final view of eliminating, or at least restricting to a very small area, diseases which destroy mankind. I call attention particularly to the efforts now making to eradicate tuberculosis. Not only is this beginning with the cow, which is so commonly

affected, but this principle is also being extended to the human animal. The idea is becoming fixed in the minds of the medical profession, as well as in the minds of the people at large, that a successful fight against tuberculosis can only be instituted on the principle of segregation which has long been applied to leprosy. It seems a hardship to condemn to a life of isolation thousands of our fellow citizens who represent the very best and noblest types of man of our civilization except physically. Isolation, rest, and outdoor life are now regarded not only as a means of preventing the spread of the disease but even as effecting a cure thereof. Those who have ample means can afford this life of isolation at their own expense, but the State must evidently provide the funds for those who, deprived of their opportunities of earning a livelihood, are condemned by law to lead a segregated life. In this case the principle of the greatest benefit to the race must be acknowledged as supreme above the sentiments of humanity and of friendship. I think the medical profession may look forward to a time not far distant when members of the community afflicted with tuberculosis will be separated from their fellow men and kept under proper sanitary conditions in camps of detention until a cure is effected or until the disease has run its course.

This is not the place to discuss plans and specifications for camps of detention for tuberculosed patients. The only thing that is necessary to be said is that upon the whole they must be conducted at the public expense and under the supervision of the State.

It may appear from the above that my idea is to impress upon the young men here who are about to receive their degree of doctor of medicine the fact that the work of the physician in the future is not so much that of the person who helps at the bedside as the one who will make the bedside help unnecessary. This to a certain extent is true, and to this extent the noblest work of the physician will be that which will curtail the opportunities for the exercise of his professional life in the way of increasing his own income. Thus it appears to me that the physician of the future, as was the case with the one of the past, will still be actuated by that noble spirit of altruism which has always characterized the true members of the profession. At the same time it must be admitted that the physician should not be oblivious to the wrongs

and ills which come to his professional career through the practice or so-called practice of medicine by quacks and pretenders. The physician is compelled by law not only to undergo a long course of training, but also, before indulging in the practice of his profession in any locality, to qualify before a board of experts and receive a license to establish the fact that he has the ability and training to practice his profession. What a shame, then, is it to see others without qualifications, except that of effrontery, and without training save that of the defrauder, openly and boldly practicing medicine, so to speak, under the very nose of the qualified physician! Under our present system any quack may advertise his wares in the public press, prey upon the fears of the sensitive citizen, and even endanger his life. This is done in the first place by making him believe he is ill, and in the second place, if he is ill, that he may be cured by the administration of the remedies offered without any knowledge of the case, the symptoms, or the conditions pertaining thereto. Thus thousands of our fellow citizens who would otherwise be under the care of the legitimate and competent physician are left to be the victims of the quack and the pretender. Without denouncing as valueless the so-called patent or proprietary medicines which are offered to the public, I must say that it is only common justice to require that before any such remedies may be sold or offered for sale in any community those who mix them and offer them for sale should be compelled to qualify in that community as a regular physician is compelled to do. If the States, therefore, would make the same rule for the *absent* treatment of disease that they do for its *present* treatment the whole system of fraud and deception which is now so much in vogue would fall to the ground. It would be quite impossible for any of these so-called pretenders to qualify before any board of competent physicians and receive a license to practice medicine in any community. Thus while the advancing science of medicine offers to the physician a restricted field of active practice at the bedside and places upon him the insistent duties of the "noblesse oblige" of his profession, public opinion should secure for him an open field and freedom from the competition of fraud, incompetence, and deceit.

You are about to receive, I believe, the degree of doctor of medicine. This is one of the things to which I object. A man

is not a doctor nor can he be a doctor at the end of his school days. Learning which should entitle one to bear this appellation is not that which is obtained in the school room and from books during the years of early youth and manhood. Real learning comes only from experience and application, and while I do not begrudge you your degree of doctor, I would be glad to see the habit of giving the doctor's degree discontinued in all the medical colleges of our country. Let the doctor's degree come in after life when each one has earned his spurs and is really entitled to the appellation of Learned and of Guide. But I congratulate you, young men, just the same, on having attained the first summit of your ambition, and being now adjudged worthy, by your professors and by the board of governors of the great University of which your school is a part, of the degree of doctor of medicine. So direct your lives that your Alma Mater may never regret having conferred upon you this sublime distinction.

Antidiastase from Tapeworms

BY L. P. HOLLISTER, LINCOLN, NEBRASKA

Previous to the discovery by Kirchoff in 1814 of a substance in gluten which hydrated starch, physiological knowledge had been inadequate in explaining how complex foods were broken down in the body and rendered fit for assimilation. With this discovery the more or less crude hypotheses concerning the reason why these changes in food take place within the body with greater rapidity and at lower temperatures than they can be brought about outside of the body gave way to the conception of definite bodies with specific action, designated enzymes later on, by Kühne.

Enzymes have the power of stimulating certain chemical reactions and have proved to be the principal means by which organisms make use of the highly complex foods such as are found in nature. But comparatively recent discoveries have shown that there are present in animals not only enzymes but also bodies, which have the power of inhibiting enzyme action. The opposing bodies are termed antiferments, antienzymes, etc., to distinguish them from the simpler chemical inhibiting agents. Ernst Weinland, for instance, in 1903 proved the existence of antitrypsin and antipepsin in the walls of the stomach and intestines and in the bodies of parasitic worms. So striking and so marked are the published reports of these experiments that, in view of the specificity of anti-bodies in general, the question naturally arose as to the existence of bodies of an antidiastatic power in intestinal worms.

A series of experiments carried out in the physiological laboratory of the University of Nebraska has yielded interesting results. The worms selected were those found in the intestines of dogs and were in the majority of cases *Taenia serrata.* They were obtained immediately after the death of dogs which had first served for other experiments. The active diastatic preparations were watery extracts of the thyroid glands of dogs. The starch employed was the soluble starch of Kahlbaum.

Experiments.—The results of the experiments appear to show that the body of the tapeworm possesses a diastatic ferment; the outer cells or surfaces possess an anti-body detrimental to the action of the diastase. For example, a water extract of ground tapeworms taken from a freshly killed dog was placed with an active diastatic thyroid extract and allowed to stand several hours. The mixture was then added to a given amount of soluble starch solution, the whole covered with toluol and allowed to stand eighteen hours. As a control an equal amount of the same active thyroid extract was taken at the same time, added to an equal amount of the same starch solution as that of the test, covered with toluol, and allowed to stand for eighteen hours. At the expiration of this time the action was stopped by boiling both test and control, the protein was removed, and the contents of the test tubes tested by means of a standard Fehling solution for the presence of sugar. The amount of sugar was then calculated. A much larger per cent of sugar was found in the solution to which the ground extract of worm had been added than in the one containing only active thyroid extract plus water. All experiments gave similar positive results. The ground extract was capable of vigorously converting the starch solution to sugar, from which it is to be concluded that the enzyme which breaks down starch is present in the body of the tapeworm.

Live worms removed from the intestines of dogs were placed in distilled water and washed thru from two to five waters. The wash water was then tested for antidiastase. In some cases the live worms were placed in active thyroid extracts for from one-half to two and one-half hours and then removed. As controls boiled worms were used. The experiments in greater detail were as follows: There were measured out in carefully labeled test-tubes equal amounts of active thyroid extract. The first served as a control; to the second were added live worms; to a third boiled worms; and to a fourth the water the worms were washed in. Where live worms were used they were removed after one-half to two and one-half hours as stated above, and all test-tubes were made up to equal volumes by the addition of distilled water. Then an equal amount of a one per cent soluble starch solution was added to each of the test-tubes and they were allowed to stand for the same length of time, generally, at room temperature,

over night. All tubes were covered carefully with toluol. When ready to test the protein was removed by the addition of sodium hydroxide and zinc sulphate which does not interfere with the action of Fehling. Filters were always carefully washed and the filtrates made up to equal volumes. Five cubic centimeters of fresh standard Fehling solution diluted to one-fifth strength for each test were heated to boiling in a porcelain dish, and the solution to be tested was titrated into the boiling liquid. This was then boiled again, always less than two minutes, and for accuracy the exact point of reduction of the copper oxide was tested with a potassium iodide starch solution as an indicator.

TABLE I

Summary of experiments to determine the presence of antidiastase in tapeworms from dogs

SETS OF EXPERIMENTS	Composition of solutions tested	Average amount of sol. required to reduce 5 c.c. diluted Fehling	Amount of inhibition
1	2	3	4
I. Control.	Thyroid extract.....	12.5 c.c.	.....
Test ...	Thy. ext. plus live worms	16 c.c.	+4.5 c.c.
Test ...	Thy. ext. plus 5th wash water.	19.75c.c.	+7.2 c.c.
II. Control.	Thyroid extract.....	9.1 c.c.	.....
Test ...	Thy. ext. plus live worms.....	12.66c.c.	+3.56c.c.
Test ...	Thy. ext. plus boiled worms ..	8.5 c.c.	—0.6 c.c.
III. Control.	Thyroid extract.....	6.3 c.c.	.....
Test ...	Thy. ext. plus live worms.....	7.55c.c.	+1.2 c.c.

These results are brought together in Table I. A reference to column 3 will show that in the first set of experiments it required 12.5 c.c. of the control solution to reduce 5 c.c. of the dilute Fehling. The like mixture in which live worms had been allowed to remain for about two and one-half hours showed a lessened ability to reduce Fehling, inasmuch as 16 c.c. were necessary to reduce the same quantity of Fehling. Furthermore, the fifth wash water was still more antidiastatic in that 19.75 c.c. were required to reduce the 5 c.c. of Fehling. These figures are mean results obtained by three or four trials in each case. The conclusion

may be drawn that live tapeworms give off to the solutions or liquids in which they are placed substances that inhibit the diastatic action of thyroid extracts. The second set of tests shows that boiled worms do not have this property. A similar statement may be made of dead worms. The worms, if allowed to stand for twenty-four hours in distilled water, covered with toluol, undergo autolysis. However, the liquid contained no trace of sugar. When live worms were placed in starch solutions for from twelve to twenty-four hours, sugar was always present in the solution. Apparently the worms contained active diastase. As shown in the first set of experiments in the table the inhibiting agent seemed to be more active or more abundant in the water in which the worms had been washed than when the worms are used directly, and thus it appears that the agent may be of the nature of a secretion from the outer surface. In the third set of experiments the worms remained in the thyroid extract for one hour only.

THE BULLETIN

OF THE

UNIVERSITY OF NEBRASKA

COLLEGE OF MEDICINE

HENRY B. WARD, Dean, Lincoln HAROLD GIFFORD, Associate Dean, Omaha

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EDITORIAL

On April 24, 1908, the Board of Regents voted to establish a school of pharmacy in the University of Nebraska. Appropriations were made for an instructor in pharmacy, pharmacognosy and dispensing and for material and apparatus necessary for practical instruction in these subjects. The office and new laboratories will be equipped during the summer months and will be ready for work with the opening of the University in September. This action of the University authorities can not but commend itself to the pharmaceutical profession of the state and to the medical profession as well. It means the establishment of a school whose aim will be to increase the efficiency of pharmaceutical training, the elimination, as far as possible, of the commercial aspect of pharmacy, and the elevation of pharmacy as a profession. During the last two or three decades commercial interests have so dominated both medicine and pharmacy that it has become a matter of common knowledge that the average physician is a prescriber and the average pharmacist is a dispenser only of patents and proprietaries. The country has been recently aroused by a campaign against these wrongs led by

prominent lay, pharmaceutical, and medical men. As a result of the interest aroused concerning the manufacture, sale, and distribution of drugs and poisons, and the passage of national and state laws relative to pure food and drugs, pharmacy, pharmaceutical chemistry, and allied sciences have been given an importance never before enjoyed. To those who have watched the recent developments in the medical and the pharmaceutical worlds it is evident that it is necessary for the two professions to cooperate in order to accomplish the greatest good, not only for themselves but for the people whom they serve. Therefore the School of Pharmacy hopes to cooperate with the College of Medicine in every possible way in order to improve medical and pharmaceutical education in Nebraska and the Middle West.

R. A. LYMAN.

The Alumni Reunion

During the recent session of the American Medical Association in Chicago the alumni of the University of Nebraska College of Medicine met in reunion at a dinner on the evening of June 2. It was the occasion for a family gathering, and the attendance was gratifying to those who came a distance to meet old classmates and fellow alumni.

Dr. Henry B. Ward was made impromptu toastmaster, and, as none other could, added zest to the already overflowing enthusiasm.

Almost intuitively the spirit of the gathering drifted to the affairs and well-being of the medical department, better known to the older alumni as the Omaha Medical College. It was with genuine interest they learned from the active members of the faculty, the broad university plane upon which the college had been placed, of the progress it is making and its high standing at home and abroad. It was evident to a casual observer there was hardly a day passed that every man present did not have an opportunity to feel proud of being a graduate of the University of Nebraska School of Medicine, and to possess an inherent hope and desire to add something to the sum total of her achievements. Especially noticeable was the sentiment to establish and endow

an alumni research fellowship that would live for all time. Much stress by many speakers was given the value of original work in upbuilding and sustaining a place among the leading institutions of learning; indeed, it was not alone a sentiment, as evidenced by pledges of material aid. Undoubtedly another alumni meeting will see definite plans formulated, and it is believed the movement will find many willing supporters. One would not need to be told the graduates of the University of Nebraska are in a large measure leaders in the states in which they practice and can well afford, for their own and the credit of their alma mater, to erect such a monument.

There were no guests of honor, altho we were honored by the presence of Dr. H. M. McClanahan, of the faculty, Mrs. W. A. Chapman, Dr. F. A. Long, of Madison, Nebraska, Dr. P. H. Salter, of Norfolk, Nebraska, and Drs. H. W. Orr, R. A. Lyman, and A. E. Guenther of the faculty.

Others in attendance were: Drs. G. L. Strader, Cheyenne, Wyoming (Nebraska), 1899; A. C. Stokes, Omaha, Nebraska, 1899; F. A. Graham, Lincoln, Nebraska, 1889; H. B. Lemere, Omaha, Nebraska, 1898; C. J. Miller, Ord, Nebraska, 1905; H. G. Thomas, Greenville, Ohio, 1896; S. J. Burwell; E. S. Putnam, Sioux Falls, South Dakota; A. A. Robertson, Crescent, Iowa, 1901; C. H. Root, Bassett, Nebraska, 1903; Henry Benson, Glenwood, Iowa, 1903; John Reid, Pilger, Nebraska, 1902; W. A. Chapman, Hastings, Nebraska, 1902; L. G. Hill, Watertown, South Dakota; J. A. Johnson, Byron, Illinois, 1894; G. C. Shockey, Melrose Park, Illinois, 1901.

G. C. S.

The arrangements were admirable and reflected the greatest credit on the energy and good judgment of our representative on the local committee, Dr. G. C. Shockey.

Ed.

COLLEGE NOTES

Francis J. Perusse, Ph.C., of the University of Kansas, has been chosen as instructor in pharmacy, pharmacognosy and dispensing in the School of Pharmacy.

Dr. J. C. Iversen, '03, and Miss Catherine Smith, both of Palmyra, Nebraska, were married June 9, and left immediately for a tour thru Colorado and the West.

Dr. R. A. Lyman attended the Nebraska State Pharmaceutical Association, held at Omaha, June 16, 17, 18. He was a delegate from the Nebraska State Medical Association.

Dr. R. A. Lyman, director of the School of Pharmacy, recently visited the universities of Iowa and Kansas, and the schools of pharmacy in Chicago and St. Louis, in the interest of the School of Pharmacy of the University.

Dr. F. D. Haldeman, of Ord, Nebraska, who has been spending the winter with his wife and son in southern California, returned to Nebraska after the Atlantic fleet reached the Golden Gate.

The following extract from a letter received from Dr. McKean is of interest:

Chiengmai Hospital and Dispensary,
Chiengmai, Siam, May 30, 1907.

Dr. Mason is a very great help to us. He and wife are doing well in the language. He is doing most of the surgery and doing it well.

Very sincerely yours,
J. W. McKean.

The articles of incorporation of the Sunlight Sanitarium Company were filed yesterday afternoon in the office of the county clerk. The incorporators are C. W. M. Poynter, H. Winnett Orr, and Irving S. Cutter. The company is capitalized at $50,000 and has property worth $20,000. The objects of the corporation are to operate and maintain a pathological laboratory and to publish hospital bulletins and reports. I. S. Cutter will have charge of the publications, which are a unique feature of an institution of this kind.

One of the most pleasant events connected with the meeting of the Nebraska State Medical Association which met at Lincoln this spring was a gathering of the alumni and faculty of the University of Nebraska College of Medicine on the 19th of May. About sixty persons gathered in one of the private dining rooms of the Lindell hotel at the noon hour, and were served to an elegant course dinner, after which various toasts were responded to by prominent faculty members and alumni. A spirit was manifested by all which bodes well for the future of the College of Medicine, and it is to be hoped that this kind of an affair may become a feature of the annual meeting of the State Medical Association.

At a recent meeting of the Board of Regents, Dr. H. Winnett Orr, for five years connected with the medical faculty, was advanced to the grade of adjunct professor. Dr. A. E. Guenther was also advanced to the grade of professor of physiology, and Dr. R. A. Lyman to that of professor of pharmacodynamics.

It was also voted to accept with regret the resignation of Dr. W. H. Christie from the chair of therapeutics on account of poor health. In view of the long service which Dr. Christie has given the College of Medicine, and in view of his public and professional standing, he was appointed professor emeritus by the Regents. The report of Dr. Christie's

death soon after was received with feelings of sincerest regret by his colleagues.

It was further voted that Dr. H. LeRoy Crummer, B.S. Michigan 1893, M.D. Chicago Medical College 1896, Interne St. Barnabas Hospital, Minneapolis, 1896–97, postgraduate work Vienna, Berlin, London, 1900, Vienna 1902, Frankfort 1904, Vienna 1907, be appointed to the chair of therapeutics.

The annual alumni luncheon of the College of Medicine was held at the Chesapeake in Omaha on commencement day, May 21. It was the largest and most enthusiastic meeting ever held. About seventy-five people were present. Many important matters were discussed, the most important one being the consideration of the advisability of establishing a research scholarship in the College of Medicine by the alumni. A committee was appointed to investigate the matter and report at the next annual meeting. The movement has the support of the majority of the alumni, and we hope that such a step will be taken and we know it will have the support of every loyal Nebraskan.

The members of the class of 1908 of the University of Nebraska College of Medicine have located as follows:

A. A. Fricke, interne in the Methodist Episcopal hospital, Omaha, Nebraska; J. B. Grinnell, in partnership with his brother, Dr. J. R. Redfield, Wood River, Nebraska; J. J. Hompes, assistant to Dr. E. B. Woodard, Lincoln, Nebraska; E. C. Hayman, interne in the Douglas County hospital, Omaha, Nebraska; W. H. Henney, Thedford, Nebraska; T. J. Kerr, interne in the Methodist Episcopal hospital, Omaha, Nebraska; Charles Lieber, interne in the Swedish Mission hospital, Omaha, Nebraska; B. B. Miller, Tabor, Iowa; J. C. Moore, Jr., interne in the Methodist Episcopal hospital, Omaha, Nebraska; F. H. Morrow, Columbus, Nebraska; D. B. Mulliken, Munson, Kansas; G. W. Prichard, interne in the Immanuel hospital, Omaha, Nebraska; Fred Premer, Bartley, Nebraska; C. Rubendall, interne in the Immanuel hospital, Omaha, Nebraska; L. T. Sidwell, interne in the State Feeble-Minded Institution, Glenwood, Iowa; E. D. Skeen, Woodbine, Iowa; G. W. Sullivan, Kimball, Nebraska; H. A. Taylor; S. L. Taylor, Hoopston, Illinois; C. C. Tomlinson, interne in the Douglas County hospital, Omaha, Nebraska; I. L. Thompson, Beemer, Nebraska; G. H. Walker, resident physician at the Sunlight Sanitarium for children, Lincoln, Nebraska; H. P. Wekesser, Lincoln, Nebraska.

The sixth annual commencement of the University of Nebraska College of Medicine, marking the twenty-seventh year of the clinical department in Omaha, was very successfully held on Thursday evening, May 21, at the Congregational church, Nineteenth and Davenport streets, Omaha. The program was as follows:

Music—Allegretto ..... Wolstenholme
Martin W. Bush, Organist.
Invocation.....By the Chaplain of the Evening
Rev. Daniel Edwards Jenkins, D.D.
Music—Intermezzo in D Flat.....Hollins
Administering of Hippocratic Oath and Presentation of Candidates
Dean Henry Baldwin Ward.
The Conferring of Degrees
Chancellor Elisha Benjamin Andrews.
The Commencement Address,
"Prophylaxis—The Great Work of the Physician."
Harvey Washington Wiley, Ph.D., LL.D., Chief of the U. S. Bureau of Chemistry, Washington, D. C.
Benediction .....By the Chaplain
Postlude—Marche Aux Flambeaux.....Guillmant
Informal Reception for the speaker, alumni, graduates, and invited guests, in the church parlors.

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