NATURAL IMMUNITY VIA AEROBIC GLYCOLYSIS As Conveyed by Carbonyl and Ethylene Groups

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Given in substance before the staff of Byron Sanitarium August 18, 1935, before the staff of the Hartford, Connecticut, Hospital December 1, 1935, before the American College of Proctology, September 21, 1937, and before the staff of Hahnemann Hospital, Liverpool, England, February 23, 1937.

There are two means of securing intermediary products of metabolism that were employed in this work of chasing down the mechanism of immunity. One measure we first employed is the removal of an essential tissue (parathyroid glands in this instance) and collecting the products of cell disintegration in the urine. Thus we found that the guanidine group served as a building unit for tissue function,* and now we know that it is important in anaerobic glycolysis as contained in the creatine phosphoric acid co-enzyme. But it holds other important functions, especially as part of the guanine group of nucleic acid which carries more importance in the aerobic oxidation mechanism than has been so far reported.

* (*Journal of Biological Chemistry*, Vol. 12, p. 313, 1912. Vol. 15, p. 43-61, 1913.)

The other means of securing the metabolites is by rapidly killing a tissue, and isolating the products of metabolism, before they can be changed too much. In this way we isolated from the cephaline and lecithin fractions of animal tissues, heart and brain, certain substances that proved curative in cancer and its allied diseases. The results were published for the first time in the *New York Medical Record* of October, 1920. We called these structures tissue thrombin because with the establishment of the immunity they produced abnormal tissues as carcinoma underwent, during absorption, a preliminary coagulation like digesting casein, and the coagulating blood protein, which must be interpreted as its first step in digestion for removal. A very fundamental physiological process was thus revealed as the first visible step in the cure of a deep-seated constitutional disease, and as a sign of an immunity which is a natural protective process which we have since found to be general against a wide field of disease changes and interferences. This has been demonstrated in our various publications.**

** ("Cancer and Its Allied Diseases") ("Natural Immunity", Vols. I, II, III, IV, 1934, 1935, 1936, 1937. *Journal of Medico Physical Research*, May, June, July, August, September, 1925. ")

Not only do animal tissues yield metabolism intermediaries, but plant tissues do also, and those that are especially active in glycolysis, such as yeasts and certain molds, are most interesting. They yield much the same products as animal tissues besides lactic acid and alcohol, and the process of anaerobic glycolysis they employ is not very different from that of animal tissues. But it is the aerobic glycolysis that is the fundamental source of energy of essential importance. From it the anaerobic debt process does its borrowing. Since heart and brain tissues contract little oxygen debt and depend mostly upon aerobic glycolysis, they yield immunogenic products. Though studied intensively, no satisfactory explanation of the process has been developed except the one which I offer here and which is important both because it is correctly constituted

chemically and because it secures lasting recovery and immunity against otherwise incurable disease, neoplastic, infectious, and allergic.

The methods of extraction of the metabolites from tissues, animal or plant, was described in the first four editions of NATURAL IMMUNITY *** issued in 1934, 1935, and 1936. The general process employed in the synthesis of the metabolites by pure chemical methods have been indicated both as to materials and procedure in these books also. The present discussion is given to clarify more fully the points they bring out and to serve as the introduction to the laboratory guide we employ in teaching the details of the synthesis of these immunity bodies.
***(Natural Immunity is available on this website.)

Ultimately, immunity depends upon a vigorous oxidation mechanism. Where there is a full oxidation of sugar, not only fats and protein products, but disease-producing toxins, are also fully burned. Full normal tissue growth and full normal tissue function depend on this process. We believe, too, that the surface energy of normally dispersed colloids and of the agglutinins, precipitins, and lysins of immunology is obtained from the oxidation mechanism. The various steps in the oxidation of sugar are each of importance to the continuity of the process, since they serve as links in the chain. The immunity they accomplish protects from infection to the point that infection is absent from healing areas and, therefore, scar tissue does not take part in the healing process. Moreover, where scars have been retained for many years at the site of old infections, the catalysts secure immunity of a degree that abolishes the old encapsulated infectious remnants and the scar tissue then disappears. In the same way allergenic toxins and the viruses of cancer and poliomyelitis are quickly destroyed so that a return to normal functional structure of the injured parts take place in a major way.

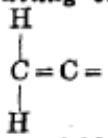
Aerobic Glycolysis

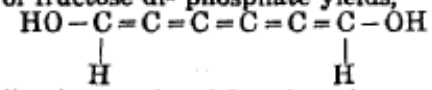
Twenty-eight years ago when starting to investigate the oxidation mechanism as a possible key to immunity, the data at hand was meager indeed. Practically all we knew was that lactic acid was an intermediary in sugar oxidation. The factors of anaerobic glycolysis as we understand them today were not known and the first suggestion of the position of guanidine as an important metabolite was made in my reports on the parathyroid glands in 1912. In order to identify the catalysts essential to the oxidation process a provisional system of oxidation was worked out. It is the system we follow, with slight modification, in this work today, and will be described here. That it is possibly the correct interpretation of aerobic glycolysis and of immunity seems well indicated by the results obtained in the cure of such severe and otherwise incurable disease as advanced fully proven cancer, tuberculosis, advanced endocrine disease, poliomyelitis, severe vascular disease, coronary thrombosis, the various allergies and infections, and often inhibited development of certain organs. Results obtained twenty years ago, and permanent even today, point to a fundamental position of the chemistry here introduced.

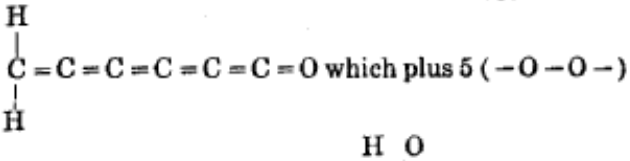
The part played by phosphoric acid and the co-enzymes that mediate its reactions in anaerobic glycolysis is well understood. The mechanism of normal aerobic sugar oxidation is not known at all. For our purposes, which require the employment of the dynamic factors operative in normal aerobic glycolysis, there is no guide, and the following scheme was, therefore, employed because it fits the needs of the present situation and because it appears more efficient than any other

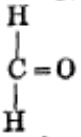
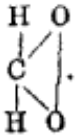
method that could be proposed. The pentose of the nucleotide is not combusted unless in dire emergency, as possibly the late phases of parathyropropic tetany when tissue disintegration is marked. Fructose and glucose di- and tri-phosphates are probably burned in the surfaces of the nuclear granules or genes, which, with the help of phosphoric acid carriers like creatine, mediate the necessary unions with hexose for dehydration purposes. It appears to me that there is special transportation of fructose di- phosphate, or its dehydrated forms, by the lymphocytes from the liver to the tissues and there may be involved some nucleotide type of union for every hexose molecule undergoing transportation, dehydration, and combustion. Be that as it may, it is necessary to assume four grades or stages of dehydrated and peroxidized products. Firstly, a chain of six carbon atoms, straight or cyclic, joined by unsaturated unions which take up peroxide oxygen and burn directly to carbon dioxide. One of the straight chains possesses a dihydroxy structure which, upon combustion, yields four molecules of carbon dioxide plus two of formic acid. The other has “ketene” structure and yields one molecule of formaldehyde and five of carbon dioxide. The cyclic form, which is derived from them both, burns completely to carbon dioxide. We call them Hexylenes to designate their origin and de-saturation as a group. This whole procedure is exothermic and efficient.

Secondly, dehydrations between the second and third and between the fourth and fifth carbon atoms, followed by peroxidation of the unsaturated unions, results in the separation of the molecule at these places into three chains of two carbon atoms each; likewise, dehydration between the third and fourth carbon atoms of the hexose followed by oxidation and separation of the molecule into two chains of three carbon atoms each. The units thus produced are one molecule of glycolic aldehyde and two of glyoxylic acid and a molecule each of glyceric aldehyde and of the aldehyde of glyceric acid. They dehydrate further to ketene, Glyoxylide, Malonene, (Lactene) and Malonide as shown below. Moreover, ketene and Malonene add oxygen and decompose to carbon dioxide and formaldehyde and its peroxide, which is one of the most important metabolites of all. These reactions are represented below.

Anaerobic glycolysis results in the splitting of hexose into lactic acid which on dehydration yields 'Malonene'.  A reaction which does not take place in the cancer cell.

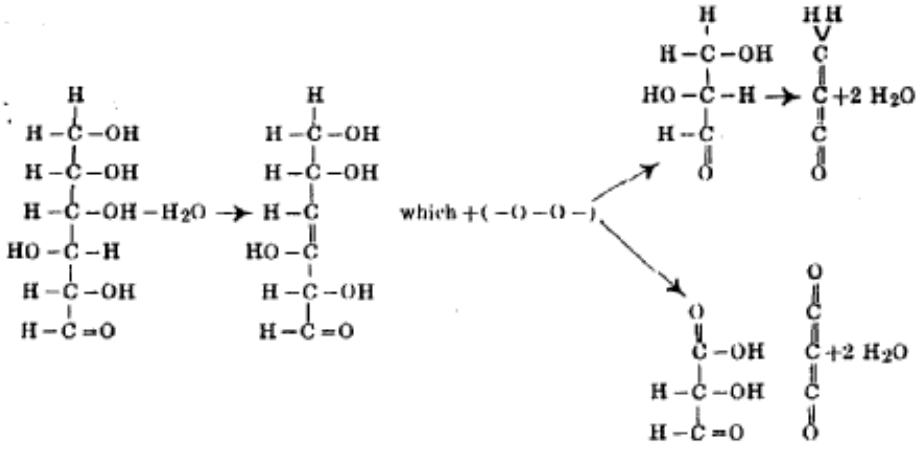
The dehydration of fructose di- phosphate yields,  which undergoes cyclization much quicker than the corresponding derivative of glucose and which plus (−O−O−) yields 4 CO_2 and 2  .

Glucose dehydrates to  which plus 5 (−O−O−)

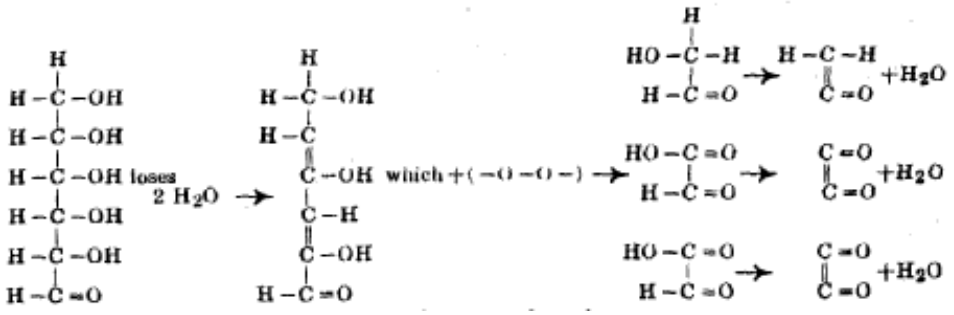
produces 5 CO_2 plus  which plus (−O−) yields  . Both formaldehyde and its peroxide play a most important part in general natural immunity in our experience.

Glucose and fructose di- phosphate may undergo cyclization directly to inositol and then dehydrate forming the unsaturated cyclic "Hexylene," which on adding peroxide oxygen burns completely to carbon dioxide or they may undergo dehydration first and then cyclization to form the cyclic Hexylene and on adding peroxide oxygen burn completely to carbon dioxide. It is possible that the derivatives of inositol found in muscle are produced by the reaction just mentioned. Each step in the process is exothermic and I believe this is the most efficient mechanism possible.

Hexose is converted to glyceric aldehyde and the aldehyde of glyceric acid, which yield lactene and Malonide, thus:



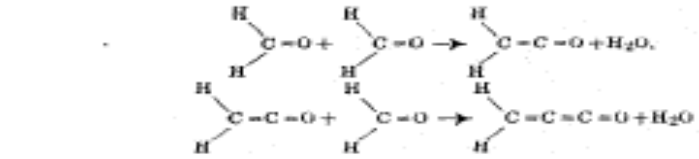
Hexose is converted to ketene and Glyoxylide, thus:



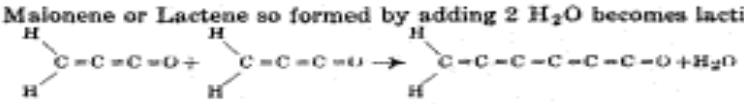
The four dehydrated ketones thus produced serve with formaldehyde, produced from ketene and Malonene, (Lactene) as carriers of the chain reactions of aerobic oxidations and in the condensations that yield sugar and ultimately glycogen.

THE REACTIONS OF FORMALDEHYDE

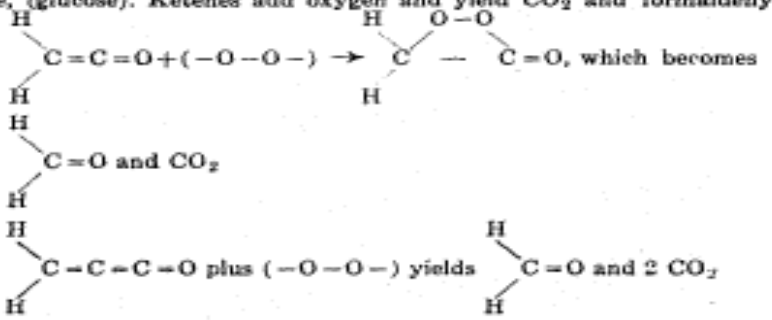
Formaldehyde might be grouped with the ketenes in our scheme of the oxidations in spite of its possession of but one carbon atom. It serves as the carrier of a chain reaction which any of the ketenes may mediate, and it also serves as the starting point for the syntheses of ketene, and lactic acid, and even of hexose and glycogen. This is possible because of the ease of union of two molecules by dehydration that forms double bonds between carbon atoms, able to take up oxygen and burn to formaldehyde and carbon dioxide on the one hand, or on the other, to take up water as the condensations are made and thus to produce the hydrated molecules mentioned, thus:



The Malonene or Lactene so formed by adding 2 H_2O becomes lactic acid.



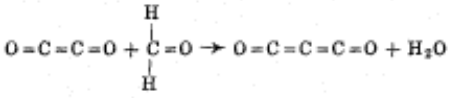
The Hexylene so formed by addition of five molecules of water becomes hexose, (glucose). Ketenes add oxygen and yield CO_2 and formaldehyde.



Thus formaldehyde is reformed with each cycle and is able to start another. So it serves as a carrier of a chain reaction. In the aerobic glycolysis of hexose the 'Hexylenes', and the dehydrated products of lactic acid we call 'Lactene' or 'Malonene' offer the structures that add oxygen to become carbon dioxide and formaldehyde. Formaldehyde may burn also by taking up oxygen to become the peroxide and then by isorrhopesis, change to formic acid which on becoming the peroxide burns to carbon dioxide and water.

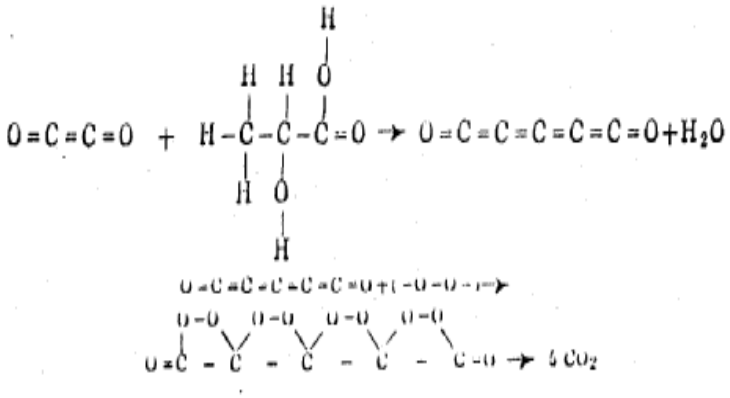
THE REACTIONS OF GLYOXYLIDE, MALONIDE, AND THE KETENES

Glyoxylide by combining with formaldehyde yields Malonide and water,
thus:

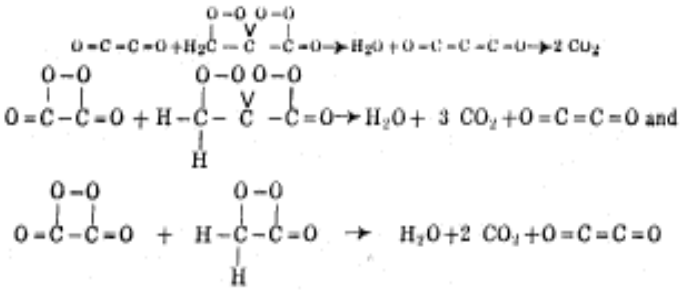


Further condensations of the same type may go on and the dehydrated bodies thus formed by addition of peroxide oxygen yield carbon dioxide.

Glyoxylide or Malonide may condense with lactic acid and after dehydration and peroxidation of the unsaturated valences yield carbon dioxide and water, thus:

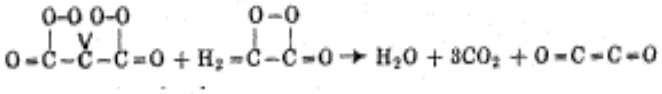


When excess oxygen is present condensation of Glyoxylide with dehydrated lactic acid (Lactene or Malonene) that has taken up peroxide oxygen yields water, carbon dioxide, and the Glyoxylide or Malonide is regenerated, to serve as carrier of another cycle or it may be oxidized in the process and burned to carbon dioxide, depending upon the amount of oxygen added, thus:



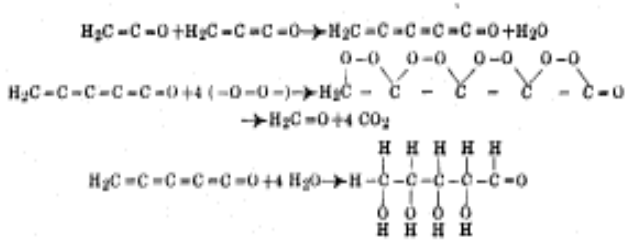
Thus the carrier O = C = C = O is regenerated with each cycle and the products are water and carbon dioxide, the reactants being fully burned.

In like manner the internal anhydride of malonic acid O = C = C = C = O mediates the same combustions forming the carrier Glyoxylide and the same resultants, carbon dioxide and water.

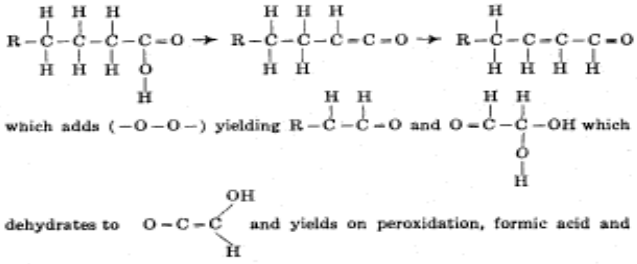


By following the above types of reactions Glyoxylide or Malonide may mediate the combustion of such fatty acid as acetoacetic acid and thus remove the acidosis of diabetes. This has been accomplished practically.

Ketene or Lactene by condensing with lactic acid either before or after dehydration and peroxidation leads to the production of formaldehyde, water, and carbon dioxide. The dehydrated product of condensation on the other hand may add water to become a pentose or hexose.



Thus energy may be yielded or utilized by the unsaturated carbon chains by oxidation or hydration, and carbon dioxide or sugar produced. The formaldehyde or ketene formed in the first reaction may also be burned or carry another cycle as the conditions determine. Fatty acid may dehydrate and then undergo hydrogen shift yielding double bonds between the alpha and beta carbon atoms which may add peroxide oxygen and split off a two carbon atom chain glyoxal leaving the long chain with a carbonyl group at which oxidation commences the same series of events.



carbon dioxide. Thus the chemical basis for oxidation of fats is provided by this system.

The procedure outlined gains probability because the intermediaries in aerobic glycolysis have never been isolated and thus must share instability of the order of the substances belonging to the scheme here presented. Hence the peroxides have not been found even though active peroxidase is well distributed in the tissues. Furthermore, oxidations of the substances here described are paralyzable by such substances as the quinones and aromatic dihydroxy compounds. Exactly such anti-oxidation influence is produced by the aromatic carcinogenic bodies, both in the body and experimentally in pure chemistry. The experiments leading to this conclusion will be published with others as a group. The production of a prolonged sensory allergy by means of dermal application of halogen derivatives of the caffeic acid, aesculin coumarin series of substances, and the production of cold light by means of fluorescent materials in the presence of

chemical reactions yielding exothermic energy helped direct our line of research at its beginning. The production of allergy and the maintenance, destruction and restoration of immunity required study, therefore, from the standpoint of photochemistry for their common solution.

Clinical Significance of the Carbonyl Group

Another not to be forgotten circumstance is the importance of iodine to the oxidation mechanism, for iodine favors the production of the ethylene linkage between the alpha and beta carbon atoms adjacent to a carbonyl group as occurs in fatty acid. We may thus picture the production of a double linkage which adds peroxide oxygen whereby two carbon atoms are removed, leaving carbonyl groups as terminals at which further oxidation proceeds. Here, also, exists the link that couples the conversion of fats to sugar and sugar to fats. It offers the explanation of the degradation of fatty acids, two carbon atoms at a time. The function of the carbonyl group in disposing its containing carbon chain to such peculiarities as that just mentioned and its ability to mediate chain reactions as those here described, and the tendency to the hydrogen shift it facilitates between three carbon atoms, where a double linkage is involved, supplies the chemical phenomena required for the necessary changes. Incidentally, the importance of iodine compounds as they are offered by the thyroid function is here evident in a mechanism of fat oxidation.

The carbonyl group present in such large molecules as anthraquinone, the sex hormones, and oxidized carcinogenic materials, may serve as carrier to a chain reaction such as we ascribe to formaldehyde and the ketenes, whereby energy is liberated so long as oxygen and substrate are supplied, and the foundation of both neoplasia and the allergies is thus laid.

The ethylene group, because it can add peroxide oxygen and split with separation of the molecule yielding a carbonyl group, supplies not only energy but also a substance able .to be oxidized further and also able to carry the chain of oxidation still further. We, therefore, claim that these groupings present in appropriate molecules are the essentials of oxidation catalysis and of immunity to disease and that their depletion or exhaustion breaks immunity. Peroxides are not efficient in this way simply because of their great explosiveness. They must yield preferably to complete combustion by their contained oxygen. They must be of the order of the metabolites produced in sugar degradation, and they should yield free carbonyl groups able to unite to , form the unsaturated di-carbonyl we call Glyoxylide or that which we call Malonide. The corresponding ketenes, where a terminal oxygen is replaced by two hydrogen atoms, be the substance as simple as formaldehyde or be the chain one which carries six unsaturated carbon atoms, as pictured above, also occupy their place in the oxidation mechanisms and immunity.

The essential catalytic activity must reside in an influence carried through inter or intra molecular space, an electromagnetic affair perhaps resulting from the movement of electrons within the molecule and between molecules. In each instance, two atoms are involved and changed. Experiment shows that where certain such movements take place between two atoms the case with which the same movements can take place between similar atoms under the same circumstances is greatly increased and thus we may explain catalytic activities of certain orders. The oxidation of benzaldehyde to the peracid is one of this type and there are many others.

The catalysis of oxidation that constitutes the immunity against infection, against allergy and against neoplasia in all their various forms, is fundamentally, therefore, an electromagnetic vibration, a rhythmic affair. Likewise, the negative catalysis basic to the disease activity is rhythmic. In both the primary waves are compoundable into larger periods so that ultimately a periodicity is expressed in an accentuation of the symptoms of the disease, or of the rate of recovery which is observable clinically. Even before a neoplasm shows up, there are often definite toxic symptoms running in waves of intensity covering many years. When the neoplasm comes it may only last a short time and an interval of healing may then show itself, after which the growth returns to stay a longer time and to grow larger than the first time. It may remain, or may again disappear more or less completely, and then return to stay, developing with periods of greater and lesser activity.

The history of the individual himself, both with respect to the pre-growth toxic state, its psoriasis, neuritis, gastric ulcer, neurosis or what not, and with respect to the mode of development of the malignancy, its rhythmicity, and its relation to the pre-growth changes, will tell much that is useful in the conduct of treatment. We night differentiate two factors in the rhythmicity, the essential rhythmicity, which is a genetic affair that is well illustrated in the case of a two and a half year old girl with malignant gliomata of both eyes that had become well metastasized to the lungs and other organs. This child demonstrated mounting aggravations each day of the last quarter of the moon. This was the mother's usual menstrual period. With the next change of the moon, the subjective symptoms improved somewhat, but the progress of the growths made during the bad period would remain stationary until the next last quarter, when another advance in the disease was made. This change was sharp and invariable whether the mother menstruated or not. I do not consider this characteristic an environmental affair, recognizing that light reflected from large surfaces, like the moon and the ocean, is circularly polarized and can affect photochemic responsiveness. The rhythmicity is probably a part of the larger order of things which takes in the moon changes as one of the concomitants. However, environmental affairs have their significance and diet, elimination, toxic exposures, as to terpenes, anesthetics, narcotics, fatigue, and the like, may set up variations of irregular rhythm. The victim of cancer is a poor oxidizer and susceptible to any form of allergy. In some, the neuroses that Freud bases upon sex behaviors are quite prominent, as they are also in tubercular patients. We regard such departures which might be aggravated rhythmically with moon changes as essentially allergic phenomena in which the impulse generative fibrillae of a certain group of neurones associated in some sex concept have absorbed the allergenic agent which forces the passage of impulses through the neurone circuits of the group. Though such impulses may be sent out in some instances quite continuously, they may not be able to jump the synapses except under the rhythmic help of cyclic events as accompany the moon changes or various environmental influences, diet, toxins, suggestions, etc. We also regard all insane manifestations as similarly caused.

It is important to study the patient's daily habits and to choose the time of giving the injection of the particular oxidation catalyst chosen at a time when the aggravation first shows up. A close study of history will reveal the most favorable times. In the case of the baby with glioma her, mentioned we could not wait until the last quarter of the moon to institute treatment because she was so far gone that she would not live that long and her suffering was too intense; so the treatment was given at once, two days after the end of the last quarter. Reactions were quite

strong, therefore, with fever of one hundred and one and over for about seven days, when improvement set in and progressed splendidly. On the other hand, had the treatment been given at the time of the beginning of strongly increasing aggravation, a rapid subsidence of the aggravation would be expected. Nevertheless, the oxidation catalysts removed the essential rhythmicity, and only improvement was observable throughout the following last quarter of the year.

The incubation period of cancer may indeed be very long and the infection may attack the parent producing cancer in the child and the grandchildren, in a very peculiar type of transmission, as occurs regularly in malignant glioma of the eye demonstrating its action through the genes. Moreover, the infectious origin of allergenic toxins is neither impossible nor devoid of other examples. The tubercle bacillus produces such a toxin and the allergy may be expressed not only in an increased susceptibility to the products of the tubercle bacillus itself by an allergic necrosis in skin, lung, and joint tissue, but there may be terrific and prolonged allergic migraine, multiple arthritis of advanced degree, and even a coronary thrombosis, as well, occurring in the same patient. Recovery takes place from all four conditions in one treatment. The rate of disappearance of the various allergic changes follows the clearing of the system from tubercular lesions, scars, and their debris. The reestablishment of healthy lung tissue to take their places. Even in these secondary allergies, an essential rhythm of the original disease may show through.

The Treatment Method

A definite treatment regime has been followed for many years, with changes from time to time of a minor nature only. We employ a vegetarian diet, raw as much as possible, well masticated, and leisurely eaten. Rest and exercise must be done to a reasonable extent, fresh air only breathed, and plenty of pure water drunk. A thorough colon hygiene is enforced, both as to the use of plenty of pure drinking water and to the use of the enema with common salt, to assure a clean colon. One should drink three or more large glasses of warm water an hour or longer before breakfast, and do some exercise if able, and then drink some more. An hour later, breakfast should be eaten. This procedure often washes the intestines well. Plenty of water should be taken during the day also.

Other sources of poisoning than the colon often exist, and the teeth are frequent offenders. All dead teeth should preferably be removed before the treatment is given. Toxic elements in the diet are to be avoided too, coffee and tea, pepper and other spices, the terpene derivatives of some fruits like oranges, lemons, grapefruit and mangoes and all green fruits should be eliminated. Turpentine and perfumes should not be breathed; nail enamels, and cosmetics as a rule should be dropped from the environment. Certain vegetables like tomatoes are not advisable, and no canned foods should be used. On the other hand the dried fruits and vegetables, to which no preservative has been added are found very serviceable. Whole grain cereals should be used freely, and honey is a valuable food. The watch-word all the time should be "close to nature"! Among the poisons of civilized life that one must avoid are the tars of tobacco and chimney smoke of industries and highways, the exhaust fumes of motors and furnaces and most factory odors and solvents. Medicines as a rule are contrary, especially coal tar products, anesthetics and narcotics. It is preferable to live in California and Florida during the winter months, or even all year around, for Florida will be found to have a lower and less extreme summer temperature than

the north. The absence of hustle and worry of such a climate and the excellent pure restful air are advantages that one should make use of, particularly for the treatment of tuberculosis and cancer, and any other serious allergy or infection. Quicker and more certain recovery should be expected. The country offers other excellent localities, but these two are not difficult to find.

The foods we recommend are:

CLASSIFIED DIET-What to Eat

Fruits (Ripe Only)
Apples Muskmelon
Bananas Ripe oranges
Dates Pears
Cantaloupe Pineapple
Figs Peaches
Fresh blackberries Strawberries (Picked
Fresh raspberries ripe)
Fresh blueberries Raisins
Fresh huckleberries Watermelon
Loganberries Prunes (sun dried)

Grains and Cereals
Barley Pettyjohn Bran Post Toasties Cornmeal Puffed Rice and Wheat Corn Flakes Rice Cracked Wheat Rolled Oats Cream of Wheat Grape Nuts Spaghetti Hominy Shredded Wheat Macaroni Vermicelli Noodles Wheatena Oatmeal Whole Wheat

Soups
Barley Cream
Bean Pea (new or dried)
Celery Rice (unpolished) Corn
Vegetable

NOTE-Do not use any spices, tomatoes, or cubes in making soup. Must not use any canned soup. Salt may be used for seasoning.

Vegetables
Artichokes (Jerusalem)
Peas, fresh
Beets-Beet tops
Peas, dried
Brussels sprouts
Potatoes, baked, boiled or
Butter beans mashed (sparingly)
Shelled new beans
Pumpkin
Cabbage
Salsify

Cauliflower
Squash
Carrots
String beans
Celery (raw or stewed)
Sweet potatoes (baked or
Corn (new) boiled)
Cucumbers
Turnips (white)
Kale
Turnip tops
Kolrabi
Lentils
Radishes
Lettuce Swiss chard
Dried Lima beans
Wax beans
Greens (all kinds except Watercress, Spinach)
Pure olive oil for salad
Onions (for flavoring) dressings

Dairy Foods
Butter
Whole Milk
Sweet Cream

Bread
Bran
Pancakes (if no sour milk is used)
Bran muffins
Biscuit (whole wheat)
Rye Bread
Corn bread
Rye Krisp
Whole wheat bread, Graham bread, Whole wheat wafers, Graham wafers, Whole wheat toast

Beverages
Apple juice (made fresh), Pear juice (made fresh)
Cereal Coffee as: Moko Coffee, Postum Cereal Coffee
Cream, one-half water
Distilled water, all you can drink

Desserts
Whole Wheat bread pudding
Prune whip with vegetable gelatine
Rice Pudding

Vanilla Ice Cream
Whole wheat plain cake
Fruit Ices
Brown Sugar
Jellies of allowable fruits
Pure Honey *-
Preserves
Pure Maple Syrup
Sherbets
Ice Cream with fruits allowable, frozen

Where fresh vegetables are unobtainable, dried vegetables or vegetables which have been put up in glass containers (cold packed) are permissible.

Condiments
Dilute hydrochloric acid diluted with water to taste, may be used as a vinegar substitute for those desiring such. Salt may be used sparingly.

The Pathogenesis and Correction of Allergy, Neoplasia, and Lost Resistance to Infection

The recovery process is rhythmic, and the essential rhythmicity of the disease should be considered in selecting the time for making the injection. After it has been given, the periodicity of amelioration and aggravation of the symptoms should be noted, so that should a second or third injection be given, it will be given at a time when an aggravation is on or should be on. The dose is never repeated when recovery is going on, whether this recovery is seen in an improvement of the local condition or in constitutional improvement. Often a period of sixty weeks must pass before repetition is made because of favorable progress all this time. Indeed recovery can complete itself quite often on one dose in much less time.

The recovery cycles are of three-and-a-half-day periods and of multiple of three-and-a-half days. Generally the third week, the sixth, ninth and twelfth weeks exhibit definite reactions, and the twenty-fourth and thirty-sixth weeks are important periods when recovery is quite evident or another dose is called for. A little experience will decide how each case should be managed, and our organization is always ready to serve any physician with all the information the treatment of any case may require.

The usual complications of cancer, such as hemorrhage and ascites, do not trouble much after the treatment, but rather tend to disappear. Improvement in heart and kidney function is to be expected as a rule, but where these functions are very badly exhausted. A large amount of cancer tissue is to be absorbed and much healing to be done, and especially where the system is generally and greatly exhausted, the work of recovery may be too much. A failure of a vital function may spell death, which would have come anyway. However, in such cases, the diminution of pain and odor, the improvement in mentality, and the lessening of narcotic requirement are causes of gratitude. Embolism may take place as in any healing process, but we see very little of it.

The pathogenesis exhibits the same chemical behaviors as the immunity mechanism, but in a modified way, and is based upon the free valency activities of both the ethylene linkage and the keto group, particularly as they are expressed by the benzene ring and its quinones of large, quite stable aromatic molecules. The chain reactions that can be conducted by the quinone group provide an evolution of energy in any tissue structure that happens to adsorb such a substance of proper make-up even if the adsorbing mechanism is normally a functional mechanism under the control of the nervous system, after it adsorbs the appropriate quinone, its function is forced beyond physiological control so long as substrate to act upon and oxygen are available. The mechanism is illustrated thus with RR representing the aromatic residue.

In much the same way, the ethylene linkage of an appropriate fluorescent molecule absorbed into a cell's functional mechanism, can take up the energy of exothermic reactions going on in its containing medium and pass it on to the functional mechanism thus forcing its activity. Of course, the ranges of radiation absorption and emission of both the fluorescent substance and the functional mechanism must be of appropriate order for the transfer of the energy, and so the specificity characteristic of the allergies is required. Thus, the mechanism is provided for specifically forcing a functional activity beyond physiological control.***
***(Natural Immunity. Fourth Edition, Supplement (1937). The *Journal of the American College of Proctology,* Vol. X. No. 3. 3, Nov. 1937, pp. 74-83.)

The oxidation mechanism of normal vigorous metabolism is all that is required to saturate both the free valences of the fluorescent pathogenic groups and of the quinone group with oxygen and thus accomplish their destruction. In this way the pathogenesis is both prevented and terminated.

When there is lack of the metabolites or of the oxidation catalysts described above, the absorption and misdirection of the energy of glycolysis, or of any other step of the oxidation mechanism, prevents the normal production of the next step in the process and hence there is lack of the catalysts formed for carrying the oxidation process further. Should this lack of catalysts weaken the oxidation process to the point where allergenic toxins and germ poisons are not destroyed, disease gets its start. When the allergenic agent is absorbed into the mitotic mechanism, allergic cell division or neoplasia is produced. When a contractile mechanism is the absorber of the fluorescent agent or of the quinone and the acceptor of the energy, then spasms such as those of asthma result. The same facts hold for all functional mechanisms, be they secretory, or impulse generative, as we find in the central nervous system. In this way all allergies may be accounted for, from hay fever to cancer and the various insanities, epilepsy, endocrine disorders, and abnormal developments. The very misdirection of the energy from any stage of glycolysis into a functional mechanism interrupts further progress in the oxidation chain concerned, and so lowers the vitality and resistance to infection of the tissue affected. Toxic developments resulting in vascular disease and especially in coronary thrombosis is accounted for in the same way.

Restoration of a vigorous normal oxidation catalysis is the corrective measure. It is nature's old-time preventive and curative protection. That it is efficient will be seen from the following case histories. The unsaturated ketones used were prepared from sulphuric acid and phosphoric acid derivatives of ethyl ether, glucose, fructose and their oxidation products by our original and patented process.

CASE HISTORIES

Cancer of Uterus
Mrs. T. Age 31
Squamous cell carcinoma of cervix uteri. Biopsy confirmed by three different pathologists. Report reads: "Sections show an atypical proliferation of squamous epithelial cells which have markedly infiltrated the underlying tissues. Diagnosis-: Squamous cell carcinoma (Epithelioma)." Surgically inoperable, invading body of uterus and adnexia. Severe hemorrhages and pain, cachexia, no children, one miscarriage. Treated with two doses of Glyoxylide solution, one cc. each, two weeks apart, August, 1923. Recovery followed with complete restoration of uterus in one year. Four healthy children born since. Perfect health remains.

Cancer of Testis
Mr. T. Age 38.
Medullary carcinoma of testis, recurrent after two operative attempts at removal. Biopsies done at these operations confirmed diagnosis each time. The last biopsy report reads: "Carcinoma probably secondary to previous carcinoma of testis as the cells were histologically similar." Recurrences involved scrotum, abdominal wall and structures of lower abdomen. Patient weak, cachetic. Treated once, June 10, 1925. Recovery complete in six months and has remained well ever since. Is very hardy and strong.

Cancer of Larynx
Mr. M. Age 58.
Treated once, November, 1928. Diagnosis confirmed microscopically by two different pathologists. "Squamous cell carcinoma of larynx showing many epithelial pearls." Involvement, vocal cords and cervical glands extensively. Voice and breathing impaired. Recovery complete within six months. Remains well. The peroxide of formaldehyde was the source of the Glyoxylide in this case.

Cancer of Stomach
Mrs. P. Age 61.
Treated twice, two week interval, November, 1919. Massive carcinoma of stomach widely infiltrated and metastasized causing complete obstruction of pyloris. Diagnosis confirmed at laparotomy. No biopsy made, or needed. Patient emaciated, bedfast. Two weeks after treatment growth considerably absorbed and pyloris opened up permitting passage of food. Thereafter recovery rapid. Patient remains well to date. Excellent health. Cephaline fraction of heart muscle extract was used as source of Glyoxylide in this case. Reported in *Medical Record*, October, 1920.

Cancer of Stomach
Mr. R. Age 69.
Treated once, August, 1926. Medullary carcinoma of stomach. After gastroenterostomy, to relieve pyloric obstruction, the neoplasms spread extensively, completely closing the new opening. Diagnosis confirmed by biopsy.

Biopsy report: "Microscopic Examination: Small alveoli combined with a diffuse growth of atypical proliferating epithelium form the structural picture of this neoplasm. The epithelial cells are generally polyhedral or round in shape, with large hyperchromatic nuclei. One portion is necrotic-a superficial ulceration. This may be classified as the diffuse type of gastric carcinoma. I am unable to determine this point exactly as it is necessary to know something of the gross appearance. If there were extensive involvement of the wall, this would be the correct interpretation. If the growth were sharply defined, rounded and ulcerating, it would be placed with the circumscribed types of carcinoma simplex. "This type is always infiltrating and early invades the lymph nodes with widespread metastases. "Diagnosis: Carcinoma of the stomach. (Type dependent upon the gross pathological anatomy.)" Bulging mass fist size when treated with one cc. of Glyoxylide solution, August 1926. Recovery complete in six months. Natural opening at pylorus now functioning, but gastroenterostomy healed shut. Remains well and vigorous.

Cancer of Rectum
Mr. M. Age 44.
Terminal case of adenocarcinoma of rectum. Biopsy before surgery and radiation reads: "Polypoid adenocarcinoma. It is of course impossible to state how deeply this is infiltrating or how extensive it is."

Biopsy after failure of these methods reports: "The specimen represents a fungoid type of growth which is soft in consistency. Two sections are saved.

"The tissue in all part of the fields examined exhibits an actual diminution of the supporting tissue and an increase of the epithelial structures. The gland epithelium as well as the gland morphology are abnormal, a marked productive change has occurred. The new growth material is distinctly anaplastic and differentiation is not good for rectal tissue. The stroma is infiltrated with small round cells, the tissue resistance is poor and the growth activity is marked.

"Adenocarcinoma of the rectum, Active."
When treated with Glyoxylide, October 1922, patient practically bedfast, cachetic, edematous. Blood picture twenty percent of normal. Rectovesicular fistula. Feces pass through penis. Considerable bowel obstruction. Putrid drainage, bleeding. Incontinence, massive metastasis in abdomen and liver. Two treatments of Glyoxylide at two-weeks interval resulted in complete recovery. In very good health in one year and remains in very good health today.

Cancer of Breast
Mrs. S. Age 51.
Sister died of cancer of the breast. Present illness started as a tumor under right arm when seventeen years old. Did not trouble until 1927, when it started to grow and pain her. Radical removal of breast was made in November, 1927. Recurrence about operation incision and in the axilla and above the clavicle was well advanced as numerous growths ranging from pea size over the chest wall to egg size axillary growths when presenting herself in September, 1929. There was also a metastasis in the lower end of the right femur. Treatment, Malonide solution was injected in upper arm; and recovery followed steadily and was completed within nine months. Reports at present confirm completeness of recovery.

Malignant Glioma of Brain
Mrs. R. Age 35.
Treated July, 1922. One dose Glyoxylide. Paralysis of right arm and leg hemianopsia. Trephine four inches in diameter through which bulged hard mass size of large orange. Cachexia extreme, projectile vomiting. Progressively getting worse since onset of disease in summer of 1921. Large liver metastasis and metastasis to spine. One dose Glyoxylide was followed by steady recovery. Masses and symptoms no longer present in November, 1922. Weight 200 pounds and perfectly restored. No recurrence of trouble to date.

Primary Cancer of Bronchus
Mr. W. Age 46.
Treated in March, 1931. Diagnosis by bronchoscopy, far advanced dyspnoeic emaciated. Unable to walk at time of treatment. Lungs and liver greatly involved. One treatment of Glyoxylide was followed by complete recovery within one year. Perfect health ever since. Doing hard labor.

Cancer of Prostate
Mr. B. Age 68.
Enormous cancer of prostate and urinary bladder with groin and abdominal metastasis. Diagnosis confirmed by biopsy by two different pathologists. Treatment given October, 1927 and June, 1928. Recovery complete within six months after second treatment. Remains well. No more pathology, good strength, normal function, and reconstruction.

Cancer of Stomach
Mrs. H. Age 47.
Duration two years. Symptoms of vomiting and hemorrhage, rapid growth of tumor to a large hard bulging mass filling the region above umbilicus. Hemoglobin 30 percent. Jaundice, marked cachexia. Radiograph demonstrates involvement of lesser and greater curvatures from pylorus to cardiac portion. One cc. of solution of Glyoxylide injected subcutaneously in arm October, 1934. Recovery with several reactions at three week periods was completed in a year. Normal in every respect. No pathology at present. Peroxide of formaldehyde was source of Glyoxylide in this case.

Cancer of Palate
Mr. J. Age 60.
Cancer of hard and soft palate. Recurrent after removal surgically. Biopsy confirmed squamous cell carcinoma. Nine small growths up to a lima bean in size. Glands under jaw enlarged and infiltrated. One cc. Glyoxylide solution given December 3, 1932 was followed by steady recovery within six months.

Malignant Glioma of the Eye
Baby R. L. Age three years and six months.
First observed by me November 21, 1935. Right eye was removed May, 1933 for rapidly developing glioma. In November, 1935 the other eye was found to be similarly affected. Surgeon advised that its removal would be useless and patient was referred for a dose of Glyoxylide. At this time pains were a prominent feature, eye was red, pupil dilated and apparently paralyzed.

Visual field was diminished by one quarter its area, and the neoplasm was visible as a mass about the size of a bean. Glyoxylide was given November 25, 1935 and August 18, 1936. Recovery was completed within a year. During the reactions mild muscle twitching in the legs took place at the twelfth to the twenty-fourth week period. This we interpret as evidence of reaction in multiple gliomata distributed in parts of the central nervous system. The results are a return to normalcy of the eye in every respect, and a very good condition of her health in general.

X-Ray Cancer
Dr. B. Age 71.
X-ray cancer developed between the first finger and thumb over an area the size of a quarter following the use of x-rays for years in dental radiography. Radium and escharotics had been used unsuccessfully and at time of the Glyoxylide treatment it had been advancing steadily for some six months. Biopsy had confirmed the diagnosis, and amputation of part of the hand was being considered. However, one dose of Glyoxylide under recommendation of Dr. D. was made on March 26, 1934. Recovery was steady and was completed in about eight months. There was also a great improvement in the general health. He remains well.

X-Ray Cancer
Dr. R. Age 65.
Had employed x-ray for a period of twenty years, following which, during the last five years x-ray cancer developed on the first and second fingers of the left hand; some malignant change showing on the thumb. The first finger was amputated after the pain had become so severe that it could not be stood and it proved to be x-ray cancer under the microscope. The second finger was under consideration for amputation too, because of the severity of the pain and the progress of the lesion when the Glyoxylide was tried in November, 1935. One dose proved sufficient and before the year was up recovery was complete with restoration of normal skin. The pain subsided rather rapidly. General health improved in many particulars also. He remains well.

Cancer of Breast
Mrs. C. N. Age 43. Housewife.
History taken September, 1926, when Glyoxylide was administered.
Past history-Abscess of right breast following injury in childhood. Rheumatism at 13. Appendectomy in 1914. Gall bladder explored in 1920. Also tonsillectomy. Since 1920, enlargement of finger joints, helped by colchicum.

Present Complaint-A hard mass above the nipple, egg size, first noticed in 1921, as a soft swelling which recently grew rapidly, large and hard causing retraction of the nipple. In January 1925, right breast was radically removed with "axillary glands and pectoral muscle, carrying the dissection to the midline over the sternum upward to the clavicle and outward to the latissimus dorsi muscle, and downward including the upper part of the rectus fascia. The pectoralis major and minor were included. The microscopic examination made is reported thus: 1. Sections from tumor proper show larger and smaller gland alveoli lined with many rows of epithelium or entirely filled by epithelium. These cells are of moderate size and have relatively large deeply staining nucleus and many of them are undergoing mitosis. In addition to these large gland alveoli the fibrous stroma of the breast is infiltrated in all directions by compressed alveoli of the same type of cell. 2. Sections some distance from the tumor show hypertrophic gland alveoli and

also large atypical alveoli like those seen in the tumor proper. 3. Other areas some distance from the tumor show no invasion, but alveoli containing large clear epithelial cells of the type designated "hyperplastic number 2" by McCarty. 4. Sections from nipple show no invasion. 5. Sections from axillary glands show large tumor alveoli in those from the midaxilla only. Diagnosis adenocarcinoma of breast." She left the hospital, February 12, 1925. The hospital reports their examination made, June 2,1925 after a series of radiations from February 9, 1925 to May 3, 1925, to show no evidence of recurrence. Likewise in July 1925, no recurrence was noted. However, patient returned to the hospital in September with pains in the right subcostal region, nausea and vomiting. Examinations were reported also in November and December, 1925, and no recurrence mentioned except the possibility of liver involvement. In late 1926, the right arm began to swell, which her surgeons account for as due to lymphatic obstruction.
Examination-On applying to me in September, 1926, examination revealed a mass above the right clavicle a little larger than an English walnut. In the right axilla two tumors were found, one the size of a hickory nut and one the size of an almond kernel. The operation area showed some malignant induration as three small tumefactions in the line of suture. The liver was enlarged by three finger-widths below the right ribs as a definite hard mass attached to the liver. She was somewhat icteric in color. Very thin and toxic.

Treatment--One cc. of Glyoxylide was given September 21, 1926. There was some definite reaction of grippiness, slight chills and fever several days later and during the third week. The metastasis absorbed completely before the end of the twelfth week. The large one above the clavicle disappearing first of all, namely, during the fourth week. In the meantime the gastric symptoms also cleared up and the liver involvement was no longer detectable after the sixth week. Her health improved steadily and her weight increased from about 87 to 103 pounds. Examination made in February, 1937, ten years after treatment shows no involvement by cancer whatever and general good health.

Discussion-This case of very malignant cancer of the breast that recurred vigorously during the year following operation of the most radical sort, and deep x-ray therapy, made a prompt complete recovery on the Glyoxylide even though the recurrences were so widespread as to involve the liver as well as the glands and tissues of the operation area and above the clavicle.

Cancer of Oesophagus and Cardia
Mrs. W. Age 52.
Family History-Suggestive of malignancy.
Past Illnesses-Gastric ulcer for over twenty years with hemorrhages.

Present Illness-Started as rapidly increasing difficulty in swallowing and a bad gastric attack of vomiting and pains which did not cease day or night until laparotomy was done on November 7, 1936 after the pain had become especially severe. Laparotomy revealed a carcinoma occupying the whole lesser curvature of the stomach more than an inch in thickness; nodular, extending up through the diaphragm and reaching to the pyloris, and encircling the cardiac end where it caused constriction and obstruction. The width over the lesser curvature amounted to about five inches; length six inches. Radiographs previously and subsequently made showed two and one-half inches of esophageal construction and evolvement. During the two weeks attack she lost fifteen pounds, and some ten pounds in the preceding few weeks because of difficulty in swallowing

which reached the stage when even water would not pass. Her weight dropped to about ninety pounds by December 7.

Treatment of one dose of Glyoxylide given December 7, 1936 was followed by a few days of achiness and Might fever and chills. Thereafter, improvement was rapid with gain of weight and complete return to normal, functionally, radio graphically, and by physical examination with gain of weight to 145 pounds. Splendid general health is fully restored.

Cancer of Rectum and Liver
Mrs. M. G. Age 67.
Housewife. History taken June 5, 1933.
Diagnosis-By history, physical examination, by exploratory laparotomy and biopsy, cancer of rectum.
Family History-Sister died of stroke at age 79. Mother died at 87. Father died at 77.

Previous Illnesses-Rheumatism of knees and ankles for the last four or five years. Thirty years ago had 18 pound fibroid tumor removed with the uterus. Good health since until two years ago when obstipation asserted itself and she concluded that she had a growth in the bowel. Examination by a good surgeon found a growth in the sigmoid in December, 1932. Obstruction became complete by April 27, 1933, when a "window" colostomy was performed, and a biopsy was made that demonstrated that carcinoma of high grade malignancy was present. The patient so informed me but a search of the hospital records by the surgeon showed the biopsy report missing. A prognosis was made at the time of about a month to live.

Physical Examination-Examination June 5, 1933, revealed an enormous mass occupying and completely filling the lower bowel, palpable through the abdominal wall to be the size of a large cantaloupe. The liver was enlarged by a fist sized mass, hard and lumpy and bulging. Fortunately the colostomy was a lateral opening without severing the bowel. The patient was extremely cachectic and weak. A copious drainage of foul bloody fluid and regular vomiting of food and decayed material was noted. The pain was very distressing.
Treatment-One cc. Glyoxylide solution was given on June 7, 1933.

Results-A reaction took place in three days, with some achiness. Thereafter there was improvement in her general health and less toxicity. The vomiting stopped. Soon she was relishing food and the pain left.

By the end of three months some feces were passed per rectum and in a year the colostomy healed spontaneously and all movements were discharged per rectum. She came to something approaching normalcy. Yet there was always some growth remaining and some discharge from the bowel. On July 30, 1934, a dose of Glyoxylide was given and thereafter a strong reaction took place, on the fourth day and during the ninth and twelfth weeks, fever, achiness, pains in the abdomen and diarrhea for a whole week. True recovery followed quite rapidly and she is in perfect health now, strong, free from cancer symptoms, and without any growth traceable in bowel or liver. Her bowels move normally.

Lymphosarcoma
Mrs. A. G. Age 40.
Family History-Mother died of cancer of the uterus at age of 62.

Past History-Appendectomy at 35. Had small lump back of neck size of pea from childhood.
Present Illness-Eight weeks ago lump began to increase to hickory nut size very rapidly and after five weeks had it removed surgically. Microscopic study revealed it to be "lymphoblastoma of lymphosarcoma type" as reported by pathologist of good standing. Rapid recurrence took place so that in three weeks the operated area became a tumefaction somewhat reddened and occupying the middle third of the Sterno-C-Mastoid muscle about an inch in diameter. Area below contained several masses the size of a pea and hard. There was rather rapidly developing toxicity and failure in general health. Loss of weight from 108 to 101 pounds in last few weeks.

Treatment of one dose of Glyoxylide was given on May 19, 1937 and recovery took place rapidly. In three weeks all tumors were completely absorbed and the weight gained to 102Y2 pounds. Inspection, August 31, 1937, confirmed the recovery. Rapid recoveries take place in cases where the growth develops rapidly and where the patient is not overwhelmed with the disease very uniformly, as this case illustrates.

Fibroid of Uterus
Mrs. B. M. Age 39. Colored.
Family history does not show cancer or tuberculosis.

Previous Illnesses-No children. Never sick since childhood. Allergic to milk and corn.
Present Illness-During last few years noticed hard lumpy swelling in abdomen. Free flowing for six to eight days at periods, always regular otherwise.

Examination-Reveals lumpy enlargement of uterus by multiple fibroids causing uterus to extend above umbilicus and bulge like six or seven month pregnancy. Cervix not infiltrated. Uterus moveable. Compression of bladder causes frequent urination of small quantity. Compression of bowel estimated by examination. Growth rests against sacrum, causes pain and constipation. Glyoxylide was given January 10, 1930. Recovery took nearly two years from this one dose. The allergy to milk and corn have also left. Uterus now normal and general health very good. Correction of allergy of a ductless gland is well illustrated in the following case.

Fibroid of Uterus
Mrs. W. Age 58.
Several years of nervousness. Tendency to perspire easily. The gradual development of extreme exophthalmus, tremor, dyspnoea, and bronzing of the skin. There was vomiting with loss of weight from 150 to 108 pounds in one year. Examination revealed also an oedema of feet and legs and the presence of a hard fixed mass bulging from and filling the epigastrium. One dose of Glyoxylide was given, September 28, 1929. Recovery was complete in about sixty weeks. She remains in perfect health to date. Normal in weight and all respects.

Fibroid of Uterus
Mrs. N. L. Age: 50 years.

Date of examination: June 25, 1934. Diagnosis confirmed by biopsy.
No cancer heredity. Mother and sister died of tuberculosis.

Patient states that 13 years ago a small sore first appeared behind the ear, which developed into a deep fissure and became gradually larger until it reached the size of a quarter in a period of three years. It was then burned out with an electric needle and subsequently she received three or four applications of three hours each of radium. July, 1932, she was given a plaster treatment and the condition grew steadily worse. Some small portions were excised and three radium needles inserted for three hours each. January, 1932, she had three more radium treatments and in March, 1933, so that altogether she had three applications of radium.

Physical findings: There is an ulcerated area anterior to the left external ear extending posteriorly through the ear and below the ear to a deeply ulcerated cavity. The lower portion of the lobe of the ear is detached from the cranium. Her present weight is 105 pounds.

Patient received treatment on June 26, 1934. The second day following this treatment she experienced chills and fever, which continued over a period of ten days and patient was confined to bed. On December 20, 1934, a second injection of the Koch treatment was given and by February 4 her health had shown definite improvement. She had gained in weight to 114 pounds. On March 18, 1935, the excreation had ceased to form on the ulcer, the edges showed a puckered, healthy appearance and her weight had increased to 118 1/2 pounds. July 20 healing was complete and she weighed 132 pounds. She continued to hold this weight and there has been no evidence up to this time, March 2, 1938, of any recurrence.

Fibroid of Uterus
Mrs. I. H. Age 29 years.
Date of examination: May 10, 1937. Mother died of carcinoma.

Patient's present illness began a year ago, when she was operated upon for a uterine tumor and had a subtotal hysterectomy. On November 1 she developed a fecal fistula and in February had a severe hemorrhage and on the 7th of May had a severe vaginal hemorrhage. Diagnosis of a section sent to Owen Laboratory of Detroit, December, 1936, showed carcinoma. In December she had one deep therapy X-ray treatment, one course of deep therapy X-ray of four sittings, and one treatment of radium for 48 hours. In December, 1936, four more deep therapy treatments were given and likewise in February, 1937. There was no improvement in the symptoms following these treatments and on May 7, three days prior to presenting herself here for treatment, she had had a very severe hemorrhage.

On bi-manual examination of the pelvis a large mass was outlined more than 4 inches in diameter and of very irregular contour, hard consistency, immovable, and tender on pressure. There was no bleeding, however, following the manipulation.

Treatment was given on May 13,1937, with no change in the course of the symptoms until June 9, 1937. At the time she received her treatment she weighed 108 pounds as compared to 198 pounds a year previous. June 9 she weighed 98Y2 pounds and another treatment was given on this date. The patient continued to lose weight until the 12th week, at which time she weighed

92Y2 pounds. After the 12th week she began to improve rapidly, the mass grew smaller, and on September 22, 1937, she weighed 110 pounds, when no mass could be outlined on examination although the recto-vaginal fistula present at the time of the initial treatment was still present. On January 26, 1938, the patient weighed 143Y2 pounds, was doing her own work, and was entirely free from symptoms.

Dementia Praecox
Mrs. D. Age 50.
Treated January, 1923. Dementia praecox with delusions of persecution lasting some six years following six years of anxiety neurosis, ten years of gastric ulcer, symptoms followed in the last two years by steady development of a massive carcinoma of the stomach palpably about the size of a grapefruit at time of treatment. Delusions that "needles and pins were put in food and drink to kill her;" could see them. Feeding forced at times. Bedfast. Recovery was complete in two years after two injections of Glyoxylide solution. After recovery patient was asked about delusions, she stated, "She knew they were not true, but nevertheless could not help believing them, head was very woozy anyway.

Therefore, in spite of her physiological judgment the delusion held sway allergically, dominating the mind. She remains well in all respects. Abdomen normal.

Dementia Praecox
Miss W. Age 44.
Colitis for twenty years. During last twelve years dementia praecox and recently spells of pain in abdomen without palpable pathology, delusions, and compulsion neuroses. Prolonged periods of violent dementia. Ten doses of potassium glyoxylate in the course of the last three years established an apparent recovery.

Shingles (infective neuritis)
Miss J. K. Age 12.
Showed lesions of Herpes Foster which had been present three days. Pain had kept her awake for four nights. Treatment was given at noon July 23rd and was followed by relief. She slept well that night and the pain never returned. The red base upon which the blisters rested had given place to normal color when seen twenty hours after the treatment was administered. With the exception of two small superficial scabs and the loss of the suntan over the affected part, all physical signs had disappeared in another week.

Acute Neuritis of Shoulder Girdle
Mrs. G. W. Age 40.
Pain in shoulder girdle very severe for two weeks, kept her awake most of each night and suffered severely during the day as well. Twelve hours after one dose of Glyoxylide, pain was permanently gone, recovery complete.

Epilepsy
Miss B.
Age 17.

School girl. Epileptic fits for over three years, occurring at night after retiring. Most often when observed, Aura centered about stomach. Not more than three fits a day, sometimes but once a week. One close of Glyoxylide solution given August 12, 1929 was followed by a gradual recession of the disease, so that by the twelfth week only a few petit mal were observed and thereafter recovery has remained complete.

Psoriasis

Miss N. Age 32.

Brother has psoriasis. Patient had tonsillitis one and one-half years ago. Tachycardia on changing posture soon followed and one month later psoriasis started on thigh and spread rapidly in spite of expert concentrated attention. At the time of Glyoxylide injection body was generally covered, hair and nails affected. Ears almost separated from scalp. Recovery completed and heart returned to normal fourteen weeks after one injection of Glyoxylide given, April 2, 1926. Recovery is permanent to date.

The Infections

The following common serious infections have been quickly overcome in animals and in men by restoring vigorous oxidation through the catalytic activity of Glyoxylide: distemper, pneumonia, severe Staphylococcus pyogenes aurens meningitis, acne, common colds, arthritis, sinusitis, Vincent's infection, acute anterior poliomyelitis, malaria, and a case of rabies in a man. Depending upon the chronicity, syphilis, leprosy, and tuberculosis have recovered rapidly or slowly. Our own experience in malaria has not been extensive but the recoveries are prompt.

Acute Anterior Poliomyelitis

Only two cases need to be reported here, one a child of two years, presenting characteristic symptoms prodromally and paralysis of both legs, feet, and thighs for forty-eight hours before treatment of one dose of Glyoxylide. Recovery was complete with normal return of muscle control within twenty-four hours. The other case was a boy of seventeen. All muscles of torso, legs, thighs, arms, neck, the internal rectus of right eye, the swallowing muscles, the diaphragm, intestines, are paralyzed. When treated with Glyoxylide paralysis of whole right leg was already established for four days, and paralysis of the other muscle groups took place within that time, until respiratory paralysis was just about complete, and cyanosis deep, patient unconscious. Recovery started to show within ten minutes after the first injection, noticed in the straightening of the right eye, slightly better breathing and diminution of the bloated abdomen, and the return of swallowing within a day. He required catheterization for four weeks. Satisfactory restoration of muscle development and control required about two years with reconstruction of right rectus abdominalis muscle and right rectus femoris still going on.

Tuberculosis

Miss A. Age 16.

Advanced tuberculosis of both lungs. Spontaneous pneumothorax, left chest. Heart shifted to the right side. Massive tuberculosis left kidney. Evident tubercular meningitis. Projectile vomiting every few minutes for three weeks, cyanotic. Fever 105. Pulse very weak and rapid. Bedfast. Treated one dose of Glyoxylide, July, 1922. Recovery took two years. Whole left lung regenerated. No more pathology traceable. Heart restored to left side. Married, has healthy twins who are very resistant to colds. Health is still perfect.

Syphilis
Mr. K. Age 32.
Treated, November, 1923. Syphilis of throat. Resistant to vigorous usual antiluetic treatment. Throat badly swollen and ulcerated. Voice lost. Skin lesions generalized. Blood Wassermann persistently positive. Condition growing worse over a year. One dose Glyoxylide was followed by complete recovery in three months. Blood Wassermann negative thereafter. Remains well.

Arthritis
Resembling the allergic lesions of lues, tuberculosis, leprosy and malignancy, in both rheumatoid arthritis, and in Osteoarthrosis advancing hyperplasia followed by necrosis is the rule. The picture is that of an unsuccessful response to infection. The restoration of a vigorous oxidation catalysis even in advanced stages with extensive ankylosis and much pain and necrosis has brought about a recovery to about ninety per cent of normal. The following cases illustrate.

Rheumatoid Arthritis
Mrs. T. Age 74.
Rheumatoid arthritis for nearly thirty years, progressive until all joints including the jaw articulations had become firmly ankylosed, and terrifically painful on touch or tension. Most joints were distorted, fusiform in shape, enclosing hypertrophic inflammatory deposits and covered with shiny skin. One dose of Glyoxylide was given in December, 1927, pain was soon better and in three months she was able to walk a few steps. In one year recovery had become about ninety per cent of normal and has so remained.

Rheumatoid Arthritis
Mr. A. Age 60.
Poker spine with rheumatoid arthritis. Painful hypertrophic and atrophic ankylosis of practically all joints including jaw articulations progressing for the last two years with occasional exacerbations. Tonsils had been badly infected for a long time; pyorrhea, sinusitis, and myocarditis present. Treatment of one dose of Glyoxylide given in January, 1937; started a rapid subsidence of pain, with absorption of hypertrophic deposits and restoration of ability to walk and open mouth. During the twelfth and fifteenth week reactions, exquisite tenderness accompanied a healing restoration of joint tissues after which perhaps a 95 percent return to normal was established with improvement still going on.

Tubercular Arthritis and Osteomyelitis
Miss S. Age 20.
Tuberculosis of left knee joint for fourteen years. Three operations between ages of six and twelve to relieve acute flare-up of osteomyelitis in lower half of femur shaft. Distortion of bone progressive with increasing ankylosis and deformity. Motion angle ten degrees. The fourth flare-up took place in July, 1934, with swelling and intense pain of the knee joint. Rapidly progressive. Could not walk. Radiographic study revealed irregular structure and contour of lower third of shaft of femur, with defective calcification and bone absorption, clouding of articular surfaces narrowing of joint space, extensive proliferation around periostial border. One dose of Glyoxylide given July 23, 1934, was followed by rapid decrease in the pain and a steady

restoration of joint and bone to normal, functionally and structurally, with perfect use of leg and full motion within nine months. General health has become excellent.

Coronary Thrombosis
Dr. B. Age 58.
In January, 1926 at time of treatment with Glyoxylide.
In this case the Coronary thrombosis was complicated with marked arterial and coronary sclerosis. He had been a busy country practitioner until 1917 when angina pectoris pains shut down on his work. They came on exertion or after eating. Finally, pains were unbearable and he had to stop practice. He could walk a hundred feet very slowly before pains put a halt to the effort. Often pain was severe without exertion. Electrocardiogram confirmed the condition of thrombosis, and the sclerosis was verified. In January of 1926,1 gave him one injection. Recovery was rather steady and I think rapid, for in three months he was again at his practice and in a year was as vigorous as ever, pretty close to normal if not entirely normal and remains so. The systemic blood vessels show no more sclerosis.

Advanced Arterial Sclerosis and Senile Dementia Paresis
Mr. P. Age 93.
Quite well most of his life, was a painter by trade. High blood pressure, with usual symptoms increasing with the years. Very feeble during last two years. In the winter of 1932, when this history was taken, he had several "strokes" and a complete spastic paralysis followed, making him perfectly helpless and speechless. I saw him in April, 1933, and gave him an injection in a muscle. At this time the man was as stiff as a board and entirely helpless. The vessels were densely sclerosed, nodular and tortuous. Improvement was evident within a month. I saw him again in July and he could walk about more or less relaxed and full control of bowels and bladder had returned. He discussed things very intelligently. I saw him again the following summer, when he was making a new cement sidewalk in front of his house and was working actively. At this time the blood vessels were elastic and smooth, but still a little tortuous, and the blood pressure was not over 160. I was able to follow him for three years, during which he remained well and active.

Discussion

Two things are to be noted, first, that the cause of the pain is removed by removing the pathogenic toxin through the restored oxidation mechanism. This is promptly accomplished. Secondly, the pain is not a result of the arterial sclerosis, which is consequent to the causative factor like the pain. Since the sclerosis is a stubborn structural change, it takes a longer time to be removed and corrected. Both the pain and the sclerosis are removed by the same mechanism that restores the normal function, for the dilated heart returns to good tone again, though not as quickly as the pain goes. In other chronic toxic states, like tuberculosis with dilated heart, a good tone is restored more rapidly than lung is restored or the body becomes completely free from germs. We may say, then, that the pain-causing factor is the toxic factor that causes the myocardial weakness and lowers the resistance to infection and causes the sclerosis. This applies also in malignancy, even though the direct cause here may be an incompletely combusted metabolite consequent to the inhibited oxidation produced by a negative oxidation catalyst of quinone, aromatic di-hydroxyl, or ethylene fluorescent structure. The oxidation of these

substances is followed by reduction of pain and, therefore, lessening of pain is one of the early signs of recovery where the pain is not produced by pressure.

It is found that acetyl choline produced at the parasympathetic nerve endings during their function, prevents the accumulation of fat in the liver on heavy fat and cholesterol feeding, when injected into the body in such minute dosage as one to ten million. One is inclined to look upon an exhaustion or fatigue and insufficiency in its production as a cause of cholesterol deposition and of the changes that regularly follow in the degeneration of the vessel wall; whereas an over-production, with consequent vessel spasm and impoverished circulation in the wall, accounts for the coronary spasm and ultimately occlusion with the changes that are consequent. Since the excess acetyl choline is normally burned and destroyed by a normal oxidation mechanism, no harm can come in the presence of good oxidation catalysis, which burns up the acetyl choline not used.

Acetyl choline cannot be held to be the only, or even the major factor in vascular disease, however, for the injured oxidation catalysis that permits cholesterol excess and deposition in the absence of normal acetyl choline production, is also responsible for the failure to burn other toxic agents that injure the tissues. The failure of sufficient oxidation catalysis may be of the degree that does not supply the energy for acetyl choline production, cm the one hand, and thus be fundamental to atheromatous change; or, on the other hand, it may be insufficient to destroy toxic agents actively producing lesions in the vessel wall that result in thrombosis and occlusion.

Even though acetyl choline spasm may prove injurious to the coronary vessels, it is not the only substance that behaves so, nor is its action nearly as destructive as the benzopyrene type of compounds or the dihydroxybenzenes and quinones that have allergenic and carcinogenic action. These substances are destroyed by the oxidation catalysts we have introduced quite like the toxic structures that cause coronary lesions and occlusion. The etiology of both types of vascular disease may thus be regarded as producible by one type of poison. The same structural type causes cancer and the other allergies, and the same structural arrangement is essential to the curative substance.

In the one instance the anti-catalytic structure is aromatic and absorbs the energy of the catalyst, nullifying it; in the other it is aliphatic and supplies a vigorous positive oxidation catalysis of sufficient activity to oxidize the negative catalyst and thus removes the etiologic factor.