PATHOGENESIS and IMMUNITY AS CONVEYED BY ETHYLENE AND CARBONYL GROUPS

In the Cause and Cure of Cancer, Allergy and Infection

by Wm. Frederick Koch, Ph.D., M. D.

INTRODUCTION

At its beginning, back in 1910, this work started as a study of the functions of the parathyroid glands, but a number of incidents directed it into a study of allergy and cancer; for the behaviors of the central nervous system and of the body muscles as influenced by the toxic amides that I was able to isolate from the urine of dogs after parathyroidectomy, revealed certain fundamental facts about the oxidation mechanism, and its influence in preserving the normal state of the tissues and their normal chemistry against toxic activities.

From the meager data available at that time on the photochemistry of catalysis, and from some muscle perfusion experiments, the system of aerobic glycolysis, presented later in this text, was evolved and used as a key Hypothesis for pursuance of the study.

Observations with fluorescent substances gave in one instance a brief but definite transfer of energy from an exothermic reaction yielding a faint blue light. Since at the time this explanation was not available, an attempt had to be made and during these cogitations, the principle of energy diversion we have used to explain the allergies and malignancy was defined.

The first check-up was secured in October 1914, when I was able to produce a sensation that continued for days after the application of a fluorescent compound of the dioxyphenylic olefin series to the skin and washing it off within a few minutes, and without the production of any visible change whatever. Thus I had to construe allergy as a hyper-responsiveness, which was not under physiological control. On the other hand, a sub-responsiveness of a functional structure due to a blocking of energy production or of its normal utilization was recognizable as the opposite phase of the process. The changes fundamental to both are discussed here.

Search for substances that carried immunity to allergy and cancer was made in fresh healthy animal tissue; and the heart and brain yielded them. Some of the results were published in the New York Medical Record, October 1920. With what was learned in part from the foregoing experiences synthetic attempts were made to produce these bodies and the results are outlined as a mere sketch in this monograph.

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Given in substance before members of the staff of Byron Sanitarium, London, Ontario, August 18, 1935; before members of the Staff of the Hartford Connecticut Hospital, December 1, 1935; before members of the staff of Hahnneman Hospital, Liverpool, England, February 23, 1937, and before the American College of Proctology, in convention, Chicago, September 21, 1937.

The oxidation mechanism supplies the energy for all vital processes and for every cell function, for cell growth, repair, and for the phenomena of immunity. This same oxidation mechanism burns up the poisons that interfere with cell function and growth and thus it overcomes disease. Indeed, efficient activity of the catalysts of oxidation determines the state of health and immunity, and therefore their supply must be maintained and protected. Since diseases often obtain entrance to the general economy through the intestine, it is important to protect the catalase and peroxidase of the intestinal mucosa from destruction. Sulfides, certain amines, amides, and oximes that might be produced in the colon through bacterial activity in conjunction with faulty diet and constipation are able to destroy these catalysts. The various metals that inactivate these oxidation catalysts, as aluminum and bismuth are known to do, should also be avoided. Thus by guarding the main portals, great advantage can be gained in health maintenance.

However, where disease has already established itself within the body something more specific and active is demanded. The renewal of a vigorous oxidation mechanism including an increase in the activity of the well-known oxidation catalysts is imperative. All of the catalysts concerned with oxidation activities are not known as yet, and the chemistry of very few of them has so far been definitely revealed. It could be recognized nevertheless that these key substances have by necessity certain properties in common, which even so long ago as in 1912, I was able to identify, though at that time the chemical structure of none was known. The conception of allergy and immunity presented here was based on the free valency common to the active groups of them all. So rapidly is confirmatory data being accumulated in our present day that one may now discuss fully the chemical natures of allergy, immunity, and of the oxidation mechanism as we employ them to remove the basis of disease.

THE CHEMICAL NATURE OF CANCER AND ALLERGY

All catalytic activities are photochemic, and therefore depend upon the residual valences of their atomic groups. They can be traced spectrographically more or less exactly. The groups important to our subject are the imide group, presenting free valency between carbon and nitrogen, the ethylene group, presenting free valency between carbon atoms, and the Carbonyl group, presenting free valency between carbon and oxygen. The type and structure of the molecule containing these groups determine the particular value and activity of each, whether or not the group serves pathogenically or protectively as a normal physiological activity.

The imide group, as present in guanidine and its methyl derivatives and in the imidazole ring of histamine, definitely paralyzes oxidations even to the point of tissue disintegration and death. This was beautifully demonstrated after parathyroidectomy. * However, these groups may protect the oxidation mechanism by their presence in certain oxidation co-enzymes, (creatine phosphoric acid) by preventing these co-enzymes from being burned in the oxidations they mediate. The imide group is able to combine directly with catalase and peroxidase, but it is more probable that it extinguishes catalytic activities photo-chemically by resonance induction, a phenomenon described by the French physicist, J. Perrin.** This group must be viewed with suspicion wherever it is found, and it brands a compound as either a toxic quencher of the oxidations or as a protected member of the oxidation system. Its fluorescence should carry much the same importance as will be said of other fluorescent groups.

The ethylene group has quite opposite values in oxidation matters when contained in a short aliphatic chain and in a cyclic molecule of high molecular weight. In the former it may be an energetic activator of the oxidations and in the latter it may serve to inhibit oxidations in three different ways that apply to the production of allergy and the destruction of immunity against infection.

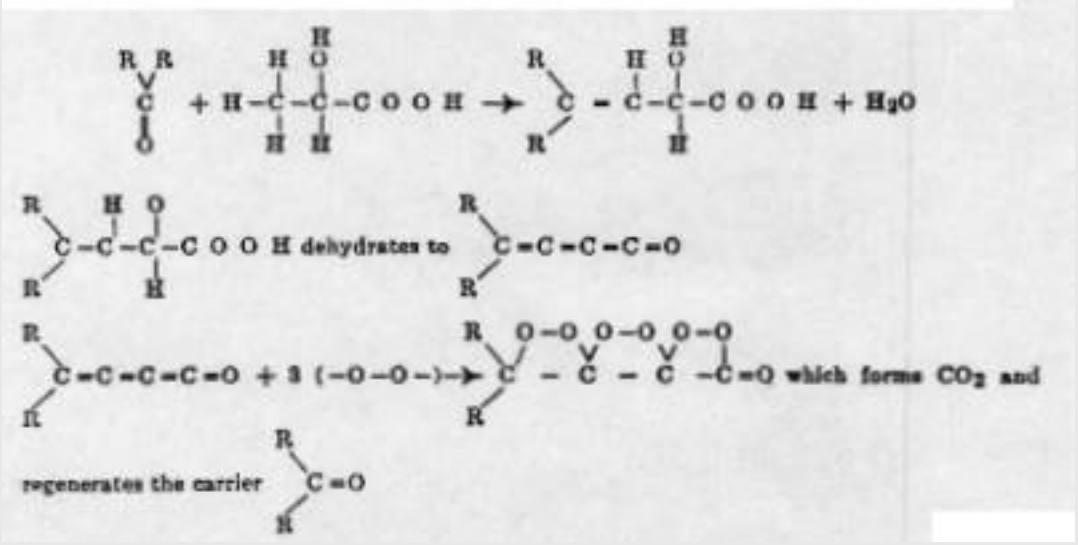
The Carbonyl group likewise carries both possibilities of furtherance or obstruction of the normal oxidation course. In a short aliphatic chain, it may serve as an active catalyst, while in the large aromatic molecules, according to structure and circumstances, it may serve the oxidations through its quinone, hydroquinone transformations. But the quinone group may carry a perpetual allergenic chain reaction using the intermediary products of sugar and fat oxidations to supply energy. It also depresses peroxidations of ethylene groups thus favoring fluorescence.

In order that the groups exhibiting free valency should serve to produce allergies of any and all kinds, they must be contained in molecules of large enough molecular weight to adsorb deeply into the colloidal structures that constitute the physiological units of the cell, for example the contractile fibrillae, the secreting fibrillae, the impulse conducting and generating units, and the reproductive units. When a fluorescent substance is adsorbed into chemically active colloidal structures like the cell functional units, and the fluorescent substance possesses a spectrum emission value equivalent to the absorption ranges of a functional unit, that functional unit will accept energy from the fluorescent substance, and this energy will activate the chemical processes of the acceptor functional unit and force its functional activity. Now it happens that fluorescent substances can absorb energy from exothermic reactions going on in the medium where they are contained; they thus become a new system, but only momentarily, for they give up this energy at their own emission range and return to their normal state. In so doing they either emit the energy they adsorbed as radiation or they pass it on to the acceptor into which they are adsorbed, and this energy activates the chemical processes and function of each acceptor unit. Thus the mechanism of forcing a function constantly and beyond physiological control comes about. Ethylene groups so behaving can be photo-chemically quenched temporarily more or less imperfectly by the imide group in an appropriate molecule, and so certain guanidine compounds have served us quite imperfectly in the past, and histidine shows a similar partial activity. Potassium iodide has a similar value and large dosage of this salt has given valuable aid in the treatment of the allergies for many years even though the mechanism was not properly interpreted. It is our opinion, that these salts overcome allergy temporarily by quenching fluorescence because of the relatively great deformability of their valency electrons.

*Koch, Wm. F., JOURNAL of Biological Chemistry, Vol. 12. p. 313, (1912), Vol. 15, pp. 43-61 (l913).
**Perrin, J., and Chourcroun, Compt. Rend., Vol. 183, p. 329 (1926).

The specificity of the allergenic substance depends, therefore, upon the similarity of the absorption spectra of the functional mechanism to the emission spectra of the adsorbed fluorescent substance. By taking up the energy of glycolysis going on in the cell it infests, and passing it to a particular functional unit, it can produce any allergy from asthma to neoplasia, neuritis, or the fixed ideas of insanity, involving passage of continuous impulses over a chain of neurons associated in some concept. Thus free valency in a molecule of difficult oxidation may not only produce an uncontrollable functional response, but it thereby also interrupts the normal progress in the oxidation of sugars, and thus it lowers the immunity against infection. So its pathogenesis is twofold, and this is our usual clinical experience.

The quinone group may carry a chain reaction with such substances as lactic acid, ketene, formaldehyde, or other metabolite and produce a continuous evolution of energy within some functional unit to cause allergy and at the same time to misdirect the progress of glycolysis, thus, with RR representing the aromatic residue, —



With the chemical properties and possibilities explained we may now consider the simplest mechanism of allergenesis and carcinogenesis.

The structures of the allergenic substances as I have defined them are repeatedly being confirmed in the synthesis of carcinogenic coal tar bodies, though no definite mode of action has been assigned to them by investigators in this field. Though they may themselves continue the allergy in the different ways outlined, it is more probable that they block the oxidation mechanism first by becoming stable peroxides which induce polymerization of structures of similar types offering free valency like the cholesterol derivatives as well as polymerization of intermediaries in fat and sugar oxidation with free valences here pictured, and of the catalysts that mediate the oxidation process. Thus accumulations of materials that resist oxidation are produced and at the same time the carriers and substrates of the process are removed, so that the oxidation mechanism is blocked. The polymerized bodies of large molecular weight possessing free valency may then produce allergy through fluorescence or through quinone carrier activity as described above. Important in this connection is the opportunity to produce polymers of various porphyrins as present in catalase, peroxidase, and various oxygen carriers, and the hydrogen acceptors of the cell. Thus the oxidation catalysts are inactivated and allergenic pyrrol derivatives might be formed. Certain bacteria in the intestine appear to have this power too, and, therefore, a meat diet should be avoided by allergic patients. The peroxides of cholesterol derivatives, producible by ultraviolet light and X-rays, and the peroxides of coal tar and benzene derivatives of the industries are the chief offenders. One has observed that the peroxides of cholesterol derivatives are produced by the sun's ultraviolet rays acting upon the skin and upon the pollen of plants. They can only be produced directly and become active in a tissue where a depleted oxidation mechanism proves insufficient to destroy them. The radiations of necrobiosis in cancer cells, convertible into mitogenetic rays by fluorescent substances of appropriate structure must be considered too. It is also important to look upon the aging of the race, the aging of the individual, and the necrobiosis in cancer cells as much the same change, for in each the energy potential of oxidation is less and less so that it more and more favors the production of stable peroxides of large difficulty burned molecules like cholesterol. The more malignant the cancer cell, the more do these facts hold true in my experience. The stable peroxides tend to catalyze the polymerization of bodies of free valency as mentioned above, and hence the tendency toward the accumulation of un-oxidized materials corresponding to the accumulation of more and more complex terpenes in plants as their age advances. This behavior appears to be attained par excellence in the cancer cell, and should it ever learn the means of surviving, it should constitute a new protective gland of internal secretion from which the whole organism must benefit. That such a means of pathogenesis is actually the case appears to be verified by the use of our treatment, which is given to shatter the polymers and to catalyze the burning of the stable peroxides beyond harmfulness and also to burn the accumulated un-oxidized material. Fevers develop after the treatment in patients in whom these things are burned and the greater the degree of malignancy, time greater is the fever. Fevers also develop sometimes in lesser degree when the fatty deposits that hold lime salts in sclerotic lesions of vessel walls and nerves or other tissues, consequent to old age syphilis and the like, are being burned. Thus the mechanism of undoing the mischief supports our contentions, and these matters are brought forth not for the pleasure of theorizing but to leave no possible measure of pathogenesis unattended to and to demonstrate that the measures we employ to cure these things are absolutely fundamental and complete in their action.

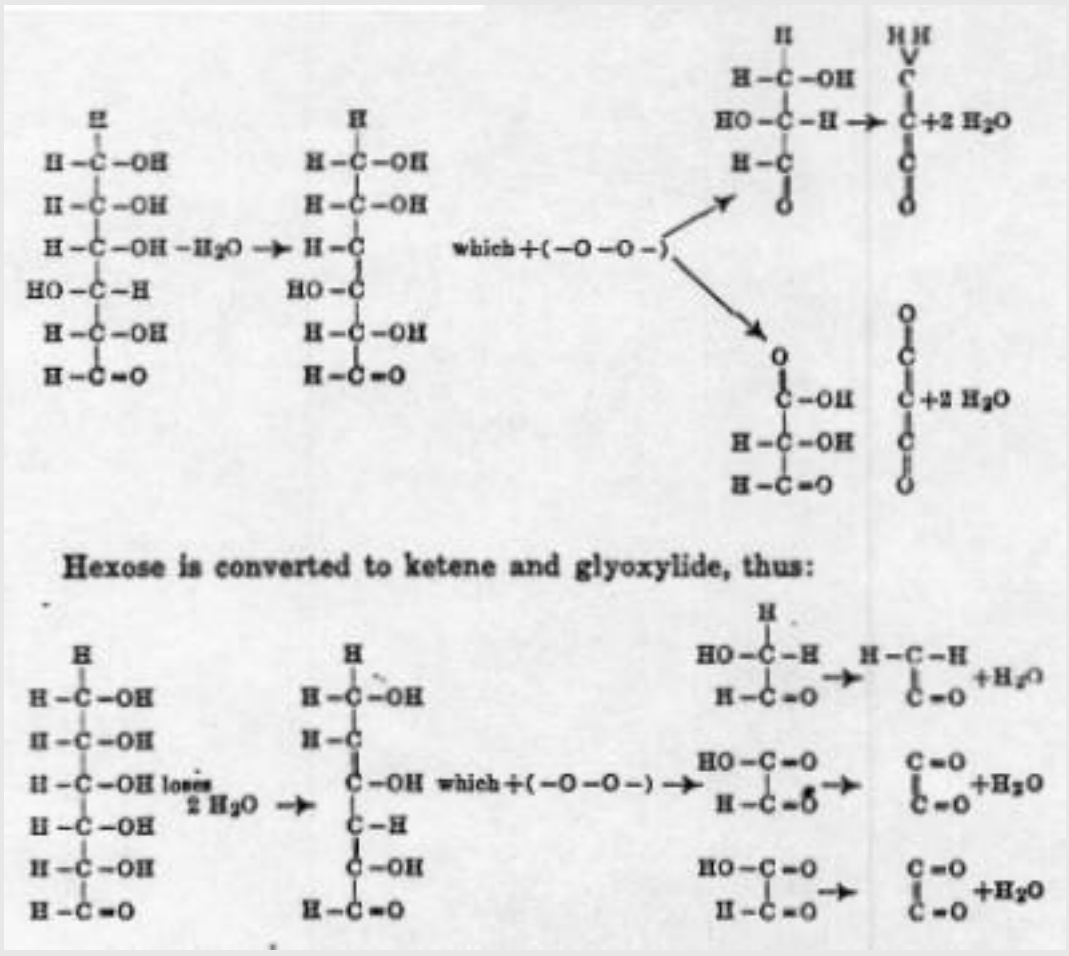
So, consequently, the problem of prevention and cure is one of restoration of a vigorous oxidation catalysis to completely burn the allergenic stable peroxides, the polymers, and the other products of deficient oxidation. For this purpose we use the structures we believe to be active in aerobic glycolysis. They comprise certain unsaturated cyclic structures, and a group of ketenes and oxyketenes of the general formulae R = C = C = O and R = C = C = C = O. The R may represent two hydrogen atoms as in the case of ketene and Lactene or Malonene, as we designate the three-carbon chain, or the R may represent an oxygen atom as in the case of Glyoxylide and Malonide, the internal anhydrides of glyoxylic and malonic acids respectively. The peroxides of formaldehyde are also used. The polymers of these bodies, which are always present, play an important role as will be seen immediately.

CHEMICAL MECHANISMS OF RECOVERY

The peroxide of formaldehyde serves in two ways. It yields by internal oxidation a molecule of water besides a free Carbonyl group which uniting with a similar group temporarily exists as Glyoxylide, (O=C=C=O). The electronic migrations concerned in this internal oxidation constitute a catalytic act of great vigor similar to what I believe peroxidase performs, and which induces the rupture of the peroxide group in the stable peroxides of the polymerizing type. The Glyoxylide structure, however, has a greater significance, which holds to a less extent for Malonide. They both have the power of taking up peroxide oxygen and combusting completely to carbon dioxide. The electronic migrations involved are both a heterorrhopesis and an isorrhopesis, which constitute all that is needed according to my view to accomplish complete oxidation catalysis for the burning of the allergenic toxins. Malonide is the clumsier and, therefore, much less active than the Glyoxylide that is so unstable that its isolation is as yet impossible. However, it can be held in a favorable state for a practical time to serve therapeutic uses.

Glyoxylide, Malonide, ketene, lactene, and formaldehyde can conduct chain reactions also that may serve the oxidation mechanism and aid in the destruction of allergenic agents. Though aerobic glycolysis remains unsolved, these substances cannot be excluded from the process both because their structure shares the instability of the normal agents and because they are able to step up the oxidations of sugar and fats and prevent 'acidosis.' The reactions pictured here are explanatory.

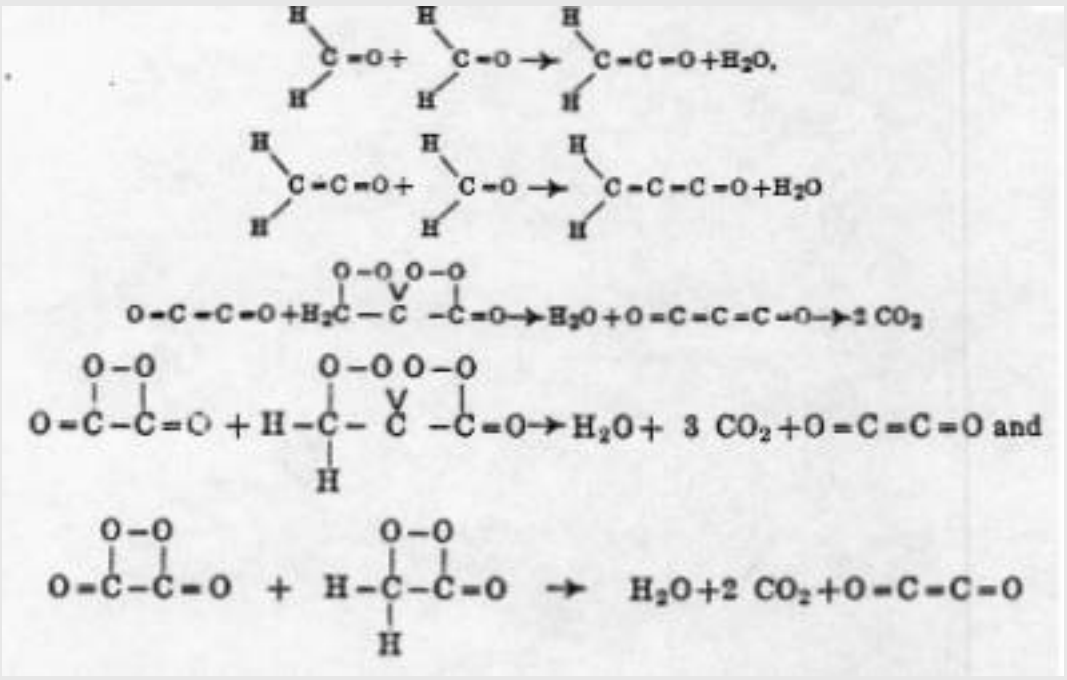
Hexose phosphate is converted to glyceric aldehyde and the aldehyde of glyceric acid, which yield lactene and Malonide, thus:



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, as glycogen from lactic acid.

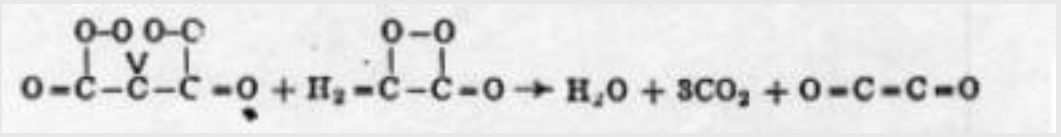
THE REACTIONS OF FORMALDEHYDE

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:



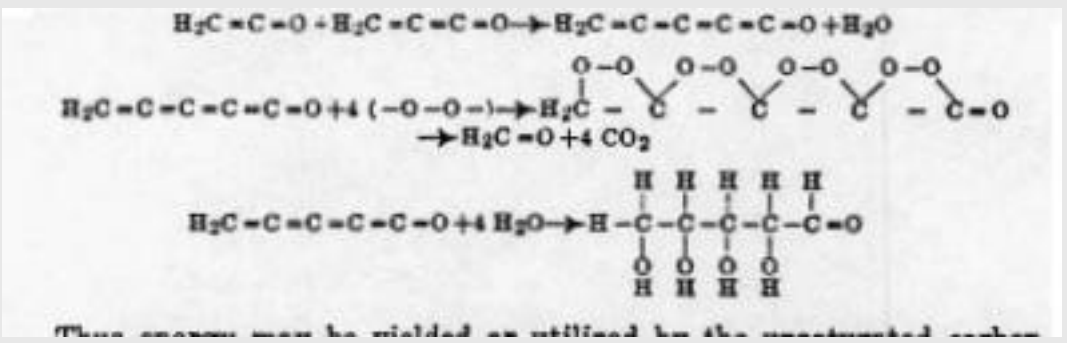
Thus the carrier (O =C= C=O) is regenerated with each cycle and the products are water and carbon dioxide, the reactants being fully burned.

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

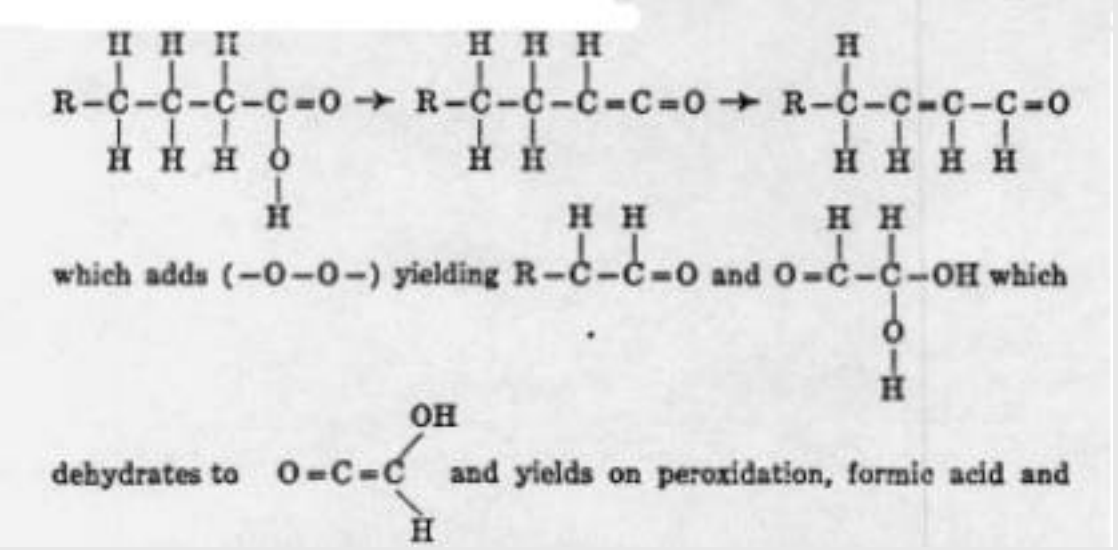


By following the above types of reactions, Glyoxylide or Malonide may mediate the combustion of such fatty acid as acetoacetic acid and thus remove the acidosis of diabetes. This has been accomplished practically.

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 of hexose.



Thus energy may be yielded or utilized by the 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 depressible 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.

The importance of the Carbonyl group in determining the necessary events requisite to the aerobic oxidation of fats and sugars as I see them are principally to favor hydrogen shift where three carbons and an ethylene group are concerned, and its tendency to favor divalency between the carbon atoms in alpha and beta position to it in fatty acid and sugar molecules in the presence of iodine. The free valencies add peroxide oxygen and cleavage takes place. Thus the place of iodine in the thyroid function is intimately explained for the first time and the reason for the rapid burning of fats and sugars through its excessive activity is comprehensible.

Our observations demonstrate that in the Warburg Chamber these agents increase the rate of oxidations of living tissues as much as thirty percent in two hours, and they step up the blood catalase and peroxidase activity enormously in gasometric and colorimetric experiments.

Polymers of Glyoxylide, Malonide, and the peroxide of formaldehyde, (dangerous) and the various ketenes, present possibility of resolution, not only by destructive distillation but also by high dilution. Further, such solutions are able to shatter the polymers of metabolites produced by the stable peroxides of cholesterol and other allergenic substances. Thus the inactivated metabolites are returned to work and the normal oxidation mechanism is again set going. In the high dilutions, both the polymers and the simple molecules are present in an equilibrium which is controlled by the extent of the dilution, and so the higher one carries the dilution, within limit, the more efficient the solution becomes. Dilutions up to 10 X 10-(30) have proven efficient in my experience within the tissues. The restored and resolved monomers become peroxides that are able to catalyze the combustion of the stable allergenic peroxides and other abnormal products.

The catalysts we employ in the treatment of disease are prepared from hexose phosphoric acid compounds and the sulphonic acid derivatives of ethyl ether, acetaldehyde, and the peroxide of formaldehyde. They contain both the polymers and the monomers of the agents discussed above and their intermediary phosphates and sulfonates.

In order to determine if the normal cell contained protective and hence curative substances I made extracts of the most resistant tissues of the body, the heart and brain. In the cephalin fraction, more than in the lecithin fraction, active substances were present which after intramuscular injection in dilute solution, brought about a coagulation, calcification, and digestion of the cancer tissue. * The recoveries followed the same cyclic course with reactions of chills and fever that we obtain by the use of the synthetic catalysts described here. Likewise, the coagulation and digestion of the cancer cells is similar and we, therefore, called them Tissue Thrombin. Maisin has likewise produced growth inhibitory and curative results with tissue products, and more recently others have repeated these results.**

*Koch, New York Medical Record, Oct. 1920.
**Maisin J. Vasilliadis, H., et Picard, Bulletin De L'Association Francaise Pour L' Etude Du Cancer, '1I XXI No. 4, Avril, 1932.

Only a crippled oxidation mechanism is required to permit the entrance, development, and activity of the poisons at the bottom of allergy; and this suppression of oxidation can come about in part by hereditary gene deficiency. But the common catalase destroyers like aluminum, bismuth, hydrogen sulphide, tannin, toxic amides, and other nitrogenous materials originating in a putrid colon and in focal infections, and also the exhaustion of catalase by fatigue and exposure play their part here just as they do in the preparation of the patient for such acute infections as pneumonia and infantile paralysis. In all of the allergies including cancer, the toxic agent is a product of comparatively anaerobic activity, be it produced in a plant, a germ, a spirochete, some virus, or from some metabolite in the body.

The toxic activity may be multiple and persist for years producing various allergic symptoms and tissue changes before an appropriate molecule has absorbed deeply enough into so primitive a structure as the reproductive mechanism to facilitate its acceptor behavior. Thus we often see years of allergic headaches, neuritis, gastric ulcer, psoriasis, arthritis, and the like, before a cancer growth comes. *** Strangely enough when the growth gets well under way the pre-growth symptoms are lessened in intensity or may disappear altogether, and the growth evidently serves as a detoxicating mechanism so far as these symptoms are concerned. But it, of course, produces other poisons incidental to its lost oxidation capacity, because it permits support to so many toxic organisms. This protective function is secondary to the allergic cell divisions for with increase in the amount of colloidal cell substance; adsorption capacity is increased favoring detoxification of the rest of the body. This factor is also facilitated by the deficiency in divalent cations and a lipoid in water phase of the cancer cell contents, whereby materials gain more ready entrance to the cancer cell than to normal cells. What the cancer cell attempts in part, therefore, is to protect the body, and come back to normal by diluting its contained toxins through multiplication.

***Koch, Cancer And Its Allied Diseases, First Edition, p. 52, (1929).

Malignancy is profoundly cyclic in its expressions. Psoriasis, epilepsy, insanity, and asthma are among the other allergies that share this quality most noticeably. Both in the pre-growth stages and in the development and progress of the neoplasm this rhythmicity may be very evident. Thus a visible cancer may come and go more or less completely before it comes to stay. In other words every malignancy probably shows at its beginning one or more partial spontaneous recoveries. But after it is once established it is there to stay and progress, unless the deficiency at its basis is made good. Reasonably enough, there is no greater difficulty in doing this late in the disease than early. However, the injuries to the general economy and to the areas affected will determine the time and effort required for full return to normalcy.

The periodicity of the aggravations may be scarcely perceptible or it may be very marked, as in the case of malignant glioma of the eye in a baby girl of two and a half years of age. This child developed a marked aggravation of all symptoms plus rapid growth increase in the tumors starting promptly the first day of the last quarter of the moon and lasting through the week. This was the mother's usual

menstrual period. During the other three-quarters of the moon the condition would remain comparatively quiescent with only slight if any progress of the disease above what happened during the unfavorable period. Taking advantage of this periodicity, one should if possible give the injection of oxidation catalysts during this phase and preferably on the first day of aggravation.

The recovery process exhibits its own rhythmicity too. Starting twenty-four hours after the injection, or sometimes a few hours earlier, or more often at the middle of the fourth day, a reaction of chills and fever and general achiness is observed. This response may not take place till the seventh or tenth day or during the third week. Such reactions generally repeat every three weeks, and more particularly at the ninth and twelfth weeks or the twenty-fourth, thirty-sixth, forty-eighth or sixtieth week, or some later period which is a multiple of three weeks or of twelve weeks from the injection. After a good definite reaction, improvement is expected, but several times I have seen severe cases recover without showing reaction, until after the recovery from the malignancy was fully established and then take place at the seventy-second week. Sometimes a recovery process will go on slowly for four years before it is completed.****

****Koch, Cancer And Its Allied Diseases, First Edition, p. 151, (1929).

The reaction fevers are to be attributed to the oxidation of materials absorbed from the growth as it undergoes digestion. But it is also to be attributed to the burning of accumulated polymerized fat and sugar products and other bodies that should have been burned up were the oxidation mechanism sufficient and unencumbered. Thus we see a step up in the oxidation efficiency with periodic accelerations at definite intervals, the smallest unit of which is generally three and a half days, or a fraction as short as twelve hours, that is, one seventh of the three and a half day cycle. The increase in the oxidation capacity of tissues in the Warburg Chamber and the marked activation of catalase by minute doses of our catalysts is likewise diphasic. The phenomenon possesses the requisites to be self-perpetuating therefore, and the clinical evidence supports this observation.

During the recovery the destroyed tissues are replaced with normal tissue elements, and not with scar tissue, because there is no infection present to call for a scar tissue capsule, and in other parts of the body where scars had been present for many years following infection, such scars are absorbed and the deformity corrected in a major way. It makes no difference whether the destroyed part is a bone, the recto-vaginal wall, the uterus, the breast, the larynx, or the tongue, and even perhaps the retina and brain. We have seen them all undergo full repair to normal structure where visible, and with return of normal function.

A few cases will illustrate.

CANCER OF UTERUS

Patient—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.

GOITRE AND CANCER OF THE RECTUM

Patient—Mrs. S. —Age 35, normal weight 152 pounds.

Family History—Father had sarcoma of right knee.

Past History—Tonsillitis periodically for years.

Pre-growth Symptoms and Status of patient—An enlarged thyroid gland for past six years, that increased in size with onset of rectal trouble, some dizziness throughout this period, with short blind spells, which let up during the last year. She had suffered with piles for years, was operated for them nine years ago and

again three years ago. Later treated by Dr. M. for a time but, as the trouble got much worse, he referred her to a surgeon, Dr. T., who made a diagnosis of cancer and refused to operate. This was in November 1922. She applied to us for treatment December 15, 1922. She had suffered severely for several months, with pain in the back and down the legs, bleeding from rectum and vagina, great difficulty of bowel movement, and finally the passage of all fecal matter through the vagina, plus a discharge of blood and pus. Weight on admission 126 pounds, anemic and weak.

On examination, December 15, 1922, it was impossible to explore the bowel through the anus as this was blocked by a mass of cancer. Vaginal examination revealed a hard nodular posterior wall perforated by a recto-vaginal fistula large enough to admit two fingers. The cancer mass extended to and involved the uterus, which likewise was nodular, greatly enlarged, hard and immovable, biopsy confirmed diagnosis, Adenocarcinoma of rectum.

The ketenes were given. Recovery was complete in five months, nearly all feces passing through the rectum without pain. Within nine months, the recto-vaginal fistula was completely healed by replacement with normal tissue, all signs and symptoms of cancer and the thyroid enlargement had completely disappeared. Her weight returned to normal and perfect health remains reestablished.

CANCER OF LARYNX

Patient—Mr. C. F. —Age 48. Salesman. History taken November 26, 1923.

Diagnosis—By history, physical examination and microscopic findings pre-growth.

Symptoms—Marked dizziness for about ten years.

Family History—Nothing definite relative to malignancy.

Past History—Well all his life. Usual weight about 205 pounds until three years ago when he had a "nervous breakdown."

Present Illness—Started with hoarseness, in May 1923, which persisted and increased to aphonia by the end of November. In the meantime he was examined by at least four throat specialists who diagnosed the condition clinically to be cancer of the larynx. A specimen was removed on November 2, 1923, which microscopically proved to be squamous cell carcinoma.

Physical Examination—The left side of the larynx was one mass of cauliflower tumefaction that obscured the natural structural characteristics. The lesion spread posteriorly over the midline and anteriorly to involve the epiglottis. Extensions were visible and palpable on both sides of the neck, mostly on the left side along the anterior border of the S.C.M. muscle, which was somewhat, displaced by the glandular enlargement. The metastases numbered four, varying in size from a bean to a walnut. There was difficulty in breathing and in swallowing, and aphonia.

Treatment—One cc. of Glyoxylide solution was given on November 29, 1923.

Results—There was some fever in twenty-four hours after the treatment and general achiness. After this subsided the patient improved in several respects. Within twelve weeks recovery was complete, so far as function was concerned. He could speak and swallow normally and had regained his strength and a weight of 225 pounds, but there was some redness and asymmetry within the larynx which did not entirely come to absolute normalcy until about the sixtieth week after the treatment. He remained in excellent health until 1933 when he had moved to Chicago. A finger was amputated, but he was otherwise well, he stated. Since then no report, has been received from him.

CANCER OF LARYNX

Patient—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 with complete

reconstruction of vocal cords and restoration of voice. Remains well. The peroxide of formaldehyde was used in this case.

MALIGNANT GLIOMA OF BRAIN

Patient—Mrs. R. — Age 35.

Treated July 1922. One dose Glyoxylide. Paralysis of right arm and leg; hemeralopia. 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. Complete bone replacement took place at trephine within two years.

MALIGNANT GLIOMA OF THE EYE

Patient—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. Malonide 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.

CANCER OF TESTIS

Patient—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 after recovery in contrast to general muscular weakness in previous part of his life.

CANCER OF RECTUM

Patient—Mr. M. — Age 44.

Terminal case of Adenocarcinoma of rectum. Biopsy before surgery and radiation reads: "Polyploid Adenocarcinoma. It is of course impossible to state how deeply this is infiltrating or how extensive it is."

Biopsy after failure of surgery and irradiation reports:

"The specimen represents a fungoid type of growth which is soft in consistency. Two sections are saved.

"The tissue in all parts of the field 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 was practically bedfast, very cachetic, and edematous generally. Blood picture twenty per cent of normal,

Recto-vesicular fistula. Feces pass through penis. Considerable bowel obstruction. Putrid drainage, bleeding. Incontinence, massive metastases 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 STOMACH

Patient—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 reports:

"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. Glyoxylide solution August 1926. Recovery complete in six months. Natural opening at pylorus now functioning, but gastroenterostomy healed shut. Remains well and vigorous.

TOXIC GOITER AND CANCER

Patient—Mrs. W. —Age 59.

Heredity—She could not trace cancer in her ancestors but exact knowledge was lacking. Her husband died of cancer of the stomach eight years previously, a fact that might have a significance. Her daughter, age 28, developed a brain tumor some years after an accident and was cured by the Glyoxylide. Her home is in the goiter belt of Ohio. In this location she both developed and recovered from the disease.

Present Illness: She had been nervous and bad a rapid pulse for several years before consulting a physician. X-ray pictures of the chest in 1927 showed heart enlargement. The pulse was exceptionally rapid and her fingers trembled and her eyes bulged. The exophthalmus was not always equal in both eyes and sometimes the right eye protruded much more than the left and would turn downward. She became short of breath, the veins in the head enlarged and engorged with blood, this condition being worse when she was lying down. The skin became bronze color and tumors developed in the abdomen. She lost from 150 to 108 pounds in weight, in spite of a gradually developing dropsy of the feet and legs that extended up above the knees at the time of her visit to my clinic.

Examination—Her chief complaint was a distress in the liver and stomach region, and our examination revealed a large mass in the epigastrium the size of a big fist and four smaller masses below the umbilicus and one the size of a walnut above the clavicle on the left side. The presence of a large tumor in the mediastinum was suggested by the difficulty in the return of blood to the heart from the head region. Marked exophthalmus tachycardia and tremor.

Treatment—One cc. of Glyoxylide solution was given September 28, 1929.

Results—Reactions of chills and fever followed several times at three-week intervals as she came to complete recovery with disappearance of every abnormal change. Her last examination was made June 18, 1933, and recovery confirmed. She claims she has perfect health, according to a report made a few months ago.

THYROID SUPPRESSION AND CANCER

Patient—Mrs. K.—Age 4-4.

Heredity—Mother and two sisters died suddenly. Father died after three strokes.

Previous Illnesses—Pneumonia at 18 years of age and influenza in 1918.

Pre-growth Symptoms—Began to gain weight rapidly six years ago. A myxedematous condition gradually developed and she was put on thyroid substance, four grains a day. Peculiar spells of loss of control of the muscles, particularly of the arms and hands, gradually developed. Dizziness and susceptibility to pus infections and a general nervousness was present during the last six years.

In March 1929, she noticed a mass in her right side of lower abdomen, which definitely bulged and made it necessary for her to bend over when she walked. She was operated upon and a small growth was removed from the labium, which was diagnosed microscopically to be a squamous cell carcinoma. The mass in the abdomen was not disturbed. Her health continued to fail. There was drainage with bad odor from the uterus. For the last few weeks she was sick in bed with pain in the right side.

Our examination made in April 1931, revealed a large mass that involved the uterus and the surrounding structures, particularly on the right side. Rectal examination revealed that the mass bulged into the cavity of the bowel, almost obstructing it. The tissue was characteristic of squamous cell carcinoma, such as it was found to be microscopically. She was rather weak and anemic. The ketene was given and recovery was gradual, not being completed until May 1933. The cancer growth had completely absorbed and the uterus was normal by March 1932, but the thyroid function did not come to near normal until the spring of 1933. While under treatment, she was not given any thyroid extract and the thyroid gradually improved. There was a slight deficiency remaining, which required about a grain of thyroid extract a week to bring the thyroid action up to par for a few years. Of late the patient has found that this is not required.

This case illustrates that considerable time is required for any reconstruction of the thyroid gland.

The metastases disappear generally before the primary lesion is absorbed and healed. The last to come is the first to go. This is because there is usually less material and because the growth is more rapid and hence the reverse process, the digestion of the cell, is also more rapid. Recurrent cases recover like primary ones.

CANCER OF BREAST

Patient—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 hyper-trophic 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 mid-axilla 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. 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 metastases 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.

The type of neoplasm may determine the rate of recovery. The fast growing types disappear more rapidly.

LYMPHOSARCOMA

Patient—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 102 1/2 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.

MALIGNANT CHANGE IN MYOFIBROMA OF UTERUS

Patient—Miss G. —Age 45. History taken December 2, 1930.

Diagnosis—Malignant change in large fibro-myeloma of uterus.

Present Illness—She had suffered with backache for a number of years and three years ago felt the presence of a tumor in the lower abdomen.. It grew larger, especially after the menopause two years ago, when with a spurt of speed it began to bulge even above the umbilicus. Glyoxylide was given on December 2, 1930, May 16, 1931, and May 9, 1932.

Results—Recovery was complete before the end of 1932. At that time no more of the mass could be palpated by most thorough examination. The first few months brought the greatest change in the size of the growth. The material that underwent most rapid digestion and absorption we consider to have been the tissue of malignant character, and the slower portion to leave was no doubt the original fibroid material. After the majority of the growth, the malignant part, had disappeared, she had a return of pre-growth symptoms, iritis and photophobia for a week, that was very troublesome but did not prevent her from attending to her work. Since that time her vision has improved and her hearing is definitely better. She is in perfect health.

This case demonstrates the common basis for non-malignant and malignant neoplastic development and the removal of the essential pathology by a single agent.

Slow recovery follows stow development of the disease.

RECURRENT CARCINOMA OF THE BREAST

Patient—Mrs. S. - Age 51. Sister died of cancer of the breast. Present illness started when seventeen years of age as a tumor in the anterior axillary border of lower sight axilla. In January 1927, she noticed it beginning to enlarge. It was removed by very radical operation in November 1927. After about six months, recurrences were observed and in September 1929, when I examined her, there were widespread and well-developed masses present over the operation area, in the axilla and above the clavicle. The largest were about the size of a hen's egg in the axilla. There was swelling of the arm and considerable pain, Moreover, the right knee pained and made walking difficult. Radiographs showed metastasis to the lower end of the femur. Malonide solution was given then and recovery was slow and steady, being completed in thirty-six weeks. Reports in 1936 were the last received and indicated perfect health.

True recovery is permanent.

CANCER OF STOMACH WITH COMPLETE PYLORIC OBSTRUCTION

Patient—Mrs. P. —Age 61, at time of treatment in November 1919. At this time, she had lost from 180 to 110 pounds in about four months, during which severe abdominal pain, anorexia, and vomiting with rapidly developing cachexia were present. The blood hemoglobin was 60%. Examination revealed a long operation scar recently made, and a bulging mass as large as a cabbage filling the upper abdomen, also a mass above the left clavicle, and a smaller mass lower in the abdomen. The findings of the operating surgeon at exploration are given in his words: "She was taken ill August 1, 1919, with what was diagnosed a gallstone colic. Needed opiates for relief of pain. During the following six weeks had repeated attacks, pain, nausea, jaundice. Was seen by several doctors, all of whom agreed in diagnosis and need of operation. I first saw her in September, in one of these attacks. I found her emaciated and anemic, suffering severely from gallstone colic, deep jaundice over entire body, itchy skin, clay stools and vomiting bile. Unable to retain any food. Temperature 98.4, pulse 112. Abdomen so tender as to make palpation impossible. I also advised operation and was requested to do so at once. I had her removed to the hospital where she was operated upon the following morning by Dr. A. and myself. To our surprise, we found the liver and gall bladder perfectly normal, no stones, no thickening of the duct walls and so forth. But the lesser curvature of the stomach was one large sausage-shaped tumor, hard in consistency, with some nodules in various spots. So much of the organ was involved and the patient in such a weakened condition, that we were both of the opinion that gastroenterostomy or any modification of such operation would be of no avail. We closed the wound, and about November, first, sent her to you. At this time, (August 8, 1920), she appears to be in splendid health, does her own work and eats everything, and certainly is grateful to you." Following

operation she sunk fast, complete pyloric obstruction being present for a number of weeks before treatment.

She was given three treatments at two-week intervals. Each was a dilute solution of the oxidation catalysts taken from the cephalin fraction of beef heart muscle. In two weeks the pyloris opened. In three months, growth free. Her case was reported with others in the New York Medical Record, October 1920. She is in fine health still as reported just two days ago. After recovery was complete, she was given a dose of a mixture of Glyoxylide, Malonide and the ketenes, and after a year, a dose of the peroxides of formaldehyde, all as a matter of insurance. Her reactions consisted of chills and fever at the third week and twelfth week after the first dose. She developed fever from the dose of synthetic agents at her twelfth week, and in all respects, the reactions were alike except much milder from the mixture of synthetic agents. The peroxides of formaldehyde showed no response, perhaps, except an improvement in health.

CANCER OF PROSTATE

Patient—Mr. B. —Age 68 at time of receiving treatment

Diagnosis—By history, physical findings and biopsy, cancer of prostate.

Family History—His father and mother both died of apoplexy. One aunt died of cancer of the stomach.

Present Illness—His trouble started in 1922 as pain in the prostate and end of penis. The urinary frequency steadily increased and he became worse in every way until in three or four years he had to pass the urine painfully every hour or so. Pain and wakefulness and the toxic injury made him weak, emaciated and of yellowish complexion. He went to the Battle Creek Sanitarium where complete diagnostic routine with radiography and microscopic examination of a specimen proved he had a far advanced cancer of the prostate. They wished to operate but he refused. Six months later he went to the Mayo Clinic where the same diagnosis was made, but they considered the condition entirely inoperable and hopeless and sent him home to die. On his way home he stopped at one of the large clinics in Chicago where the diagnosis was again confirmed, and one of the doctors privately suggested that he come to see us. He left for Detroit the same night and we made our examination the next day, October 24, 1927.

Physical Examination—Rectal examination revealed a hard, somewhat nodular growth that was at least the size of a baby's head occupying the anterior rectal wall, and bulging both towards the sacrum and into the abdomen. It expanded the width of the bowel cavity. The mucous membrane was tight, hard and nodular, being thoroughly infiltrated by the growth. The condition was so well advanced that bladder function was destroyed so far as storage of urine was concerned and complete obstruction of urine threatened. The glands in both groins were involved as walnut-sized masses.

Treatment—Two injections of Ketene solution were given, one in October 1927, and one in June 1928.

TUBERCULOSIS

Patient—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 105Â°. 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.

TUBERCULAR ARTHRITIS AND OSTEOMYELITIS

Patient—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; wits perfect use of leg and full motion within nine months. General health has become excellent.

GASTRIC ULCER

Patient—Mr. W. F. —Age 38.

Family History—Negative to cancer.

Past History—Measles and chicken pox in childhood, pneumonia at 20 and again 4 years ago.

Pre-growth Symptoms and Status of Patient—Stomach trouble started as indigestion when 16 years of age, always taking soda. Operated on in 1913 for appendicitis, the appendix found normal; operated on in 1914 by the same surgeon for gastric ulcer; he resected two small ulcers and one large ulcer and made a gastroenterostomy; no relief. The patient kept taking soda continually; the stools were black, had pain and gas, was unable to straighten up for years, the pain extended through the epigastrium to the back. He was careful about diet to date of admission, was very nervous all the time. In the year 1920, his weight dropped from the normal of 155 to 135. On January 8, 1920, he had two severe gastric hemorrhages that left him nearly bloodless and cold. His physician had him well packed in ice but that did not stop the bleeding. Tarry stools were passed for several succeeding days. Our examination on January 12, 1920, revealed a cancer mass in the epigastrium the size of a fist. The ulcer was still bleeding.

Ketenes were given and recovery was complete in four months with disappearance of all stomach trouble and the mass in the abdomen. Chills, a slight fever and achiness for the first six weeks following treatment constituted the reactions in this case. He now weighs 197 pounds and is in the best health he ever experienced; stomach functions perfectly on any diet.

Acute infections may produce allergic necrosis, poliomyelitis and Vincent's infection being good examples.

ANTERIOR POLIOMYELITIS

A boy of two and half years of age was brought to me in September 1931, with both legs in flaccid paralysis. He had taken sick three days before with headache, vomiting and fever, and awakened two days before my observation with both legs paralyzed and quite ill. The mother had been cured of malignancy of the breast by this treatment several years previously and desired the child to have the same treatment that had cured her, no matter what the condition was, and especially since there was nothing definite for the family doctor to do. The reflexes were abolished and there was foot drop, both legs being equally affected. Treatment was given and the mother requested to hold the child for an hour. He was then asked to move his legs, which he could do quite well. After another hour he was asked to walk and this he could do for a few steps. Recovery was completed in twenty-four hours.

One other case is that of a boy age 16, six feet, two inches tall, 190 pounds, very strong and muscular, exposed to very cold water and much exertion for six hours nearly to the point of exhaustion. He had been eating plentifully of "hot dogs" for the week previously, and might have carried some intestinal poisoning that lowered his general resistance. He took sick with vomiting, headache, fever and general achiness August 20, 1935, in the evening. The next morning the right leg was paralyzed. He tried to be about, nevertheless, until he dropped with a more general paralysis that involved all the muscles of the back, trunk, neck, abdomen, diaphragm, pelvis and left arm and right leg. The left leg was too weak to move but there was no foot drop. The right eye turned outward and the face muscles twitched. He had been crying with pain for two days and nights, pain through the spine and abdomen, in spite of narcotics the local doctor had given him. When I

arrived August 25, 1935, respiration and swallowing were about paralyzed and the bladder and intestines were also paralyzed. He had not passed urine for two days at a stretch. There was delirium, cyanosis and the "death" odor. Dr. A. who hurried with me to the bedside gave a prognosis of a few hours to live, unless the treatment would prove helpful. Glyoxylide solution was given and very soon the pain was better and the face twitching ceased. In twenty minutes the abdominal bloat started to subside and the eye straightened out. The cyanosis lessened and respiration improved.

It was necessary to catheterize him every four hours for four weeks before normal function returned. Five treatments were given at two and three-day intervals and recovery progressed rapidly after the fourteenth week. There is no paralysis remaining, but the muscles most affected are still the weaker muscles especially the quadricep extensor of the right leg. However, it is steadily gaining strength and he is able to walk without defect though climbing stairs is not as good as normal. During the reactions every seventh day there was some cyanosis and rapid pulse for several hours but after the twelfth week from the last treatment the readjustment was complete so they did not occur again. This phenomenon reflects the injury to the vasomotor nerves caused by the infection, and also displays the rhythmic nature of the recovery process.

Both coronary thrombosis, a late sequel of rheumatic infection, and obliterative endarteritis display allergic vascular injuries with hyperplastic response more evident in the latter.

OBLITERATIVE ENDARTERITIS

Patient—Mr. S. K. —Age 5O. History taken July 23, 1928.

Diagnosis—obliterative endarteritis.

Past History—Enjoyed good health until 40 years of age. For last ten years suffered with gastric ulcer, but obtained comparative comfort by careful diet, taking soda and so forth. In the summer of 1927, he found it progressively more and more difficult to walk about when playing golf. Walking caused pain in the feet, and rests became necessary at shorter and shorter intervals. Diagnosis of obliterative endarteritis was made by a number of experts and the blood sugar of 380 was found. He was given insulin treatment but grew worse. He was finally advised of the hopelessness of his case, that he should stay in bed, take such opiate as was necessary submit to the necessary amputations and await the end.

Present Illness—Our examination made July 23, 1928, disclosed considerable nutritional in jury, the yellow waxy color of one suffering rapid blood destruction, but no tumor mass could be found. Although both feet and the right leg were severely involved with the endarteritis no gangrenous decomposition had yet taken place. The toenails, however, appeared dead. There was great pain on motion, but he could get about some.

Treatment—One cc. of the Glyoxylide was given in July 1928.

Results—In a few weeks a rapid improvement took place and he was able to return to work. Within twelve weeks the anemia gave way to a normal blood quota and fine healthy color. During this period the gastric ulcer symptoms completely cleared away and the left foot and leg practically gained normalcy. The solid cord-like vessels became thin, compressible and pulsating and after pressure on the skin the blood came back with normal rapidity, and by the fifteenth week he could walk all day without pain or inconvenience. The toenails regained much of their normal pink color. However, the right foot and leg did not regain true normalcy until after the eighteenth week had passed. With his recovery he acquired the best health he had experienced since he was thirty years old and his urine remained free from sugar. Blood sugar dropped to between 80 and 90 mmgs. and remained normal. He indulged in periods of excessive work, and in May 1933, after a prolonged period of exertion he dropped dead from heart failure.

CORONARY OCCLUSION

Patient—Dr. H. G. A. —Age 64. (Courtesy Dr. D. H. Arnott)

A physician had been bothered for a couple of years with pain and stiffness in his

shoulder Joints; but one did not recognize the essential rheumatic nature of his disability. While walking December 2, 1936 he was suddenly disturbed with a severe pain in the center of his chest. After resting a short time, this passed away. However, it returned with terrible severity two days later, while he was quiet in his own home. Heavy, hypodermically-administered doses of morphine relieved him, only while the narcotic action rendered him unconscious.

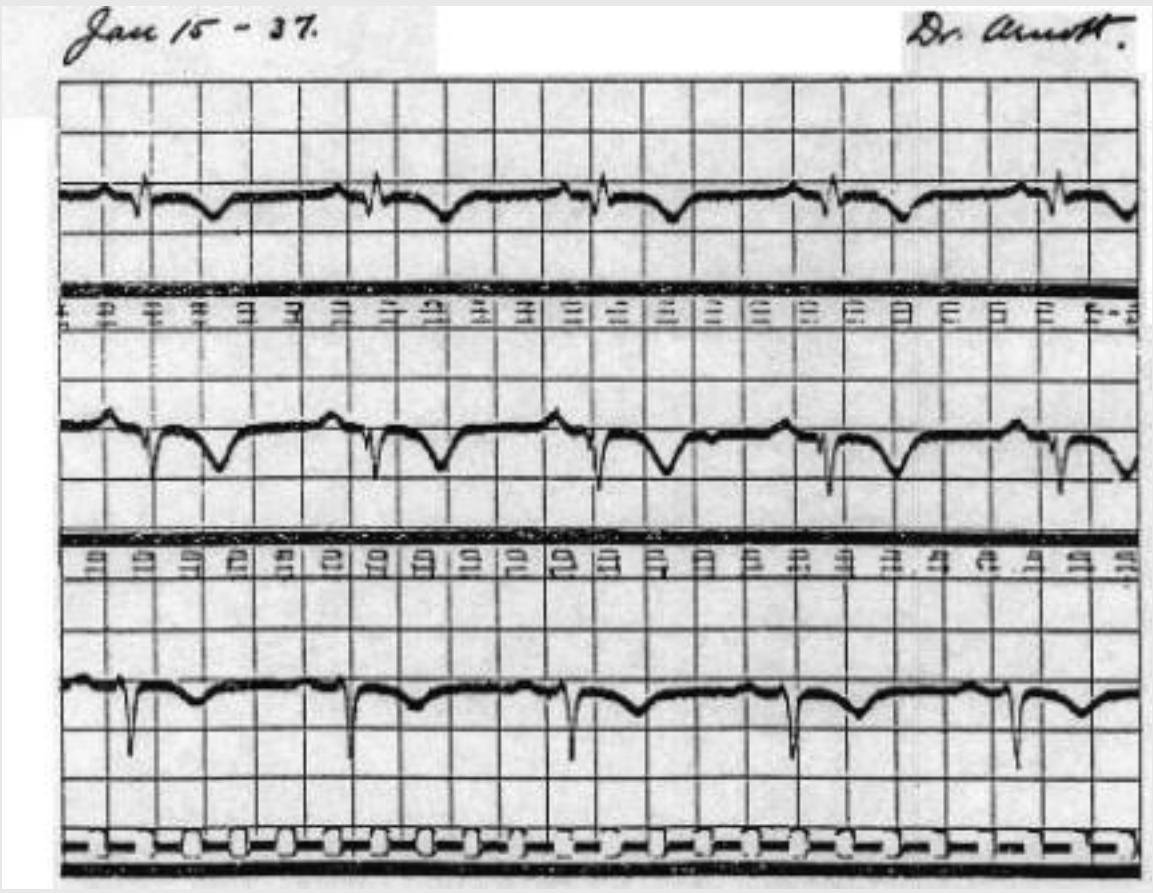
Glyoxylide was used December 8, and this gave him considerable relief in a few hours. Three and a half days later, a second dose was given, following which all pain subsided and has not recurred.

Five weeks after the pain had left him, an electrocardiogram showed evidences of severe coronary damage. Nine weeks later, a second tracing disclosed a practically normal condition. These graphs are reproduced.

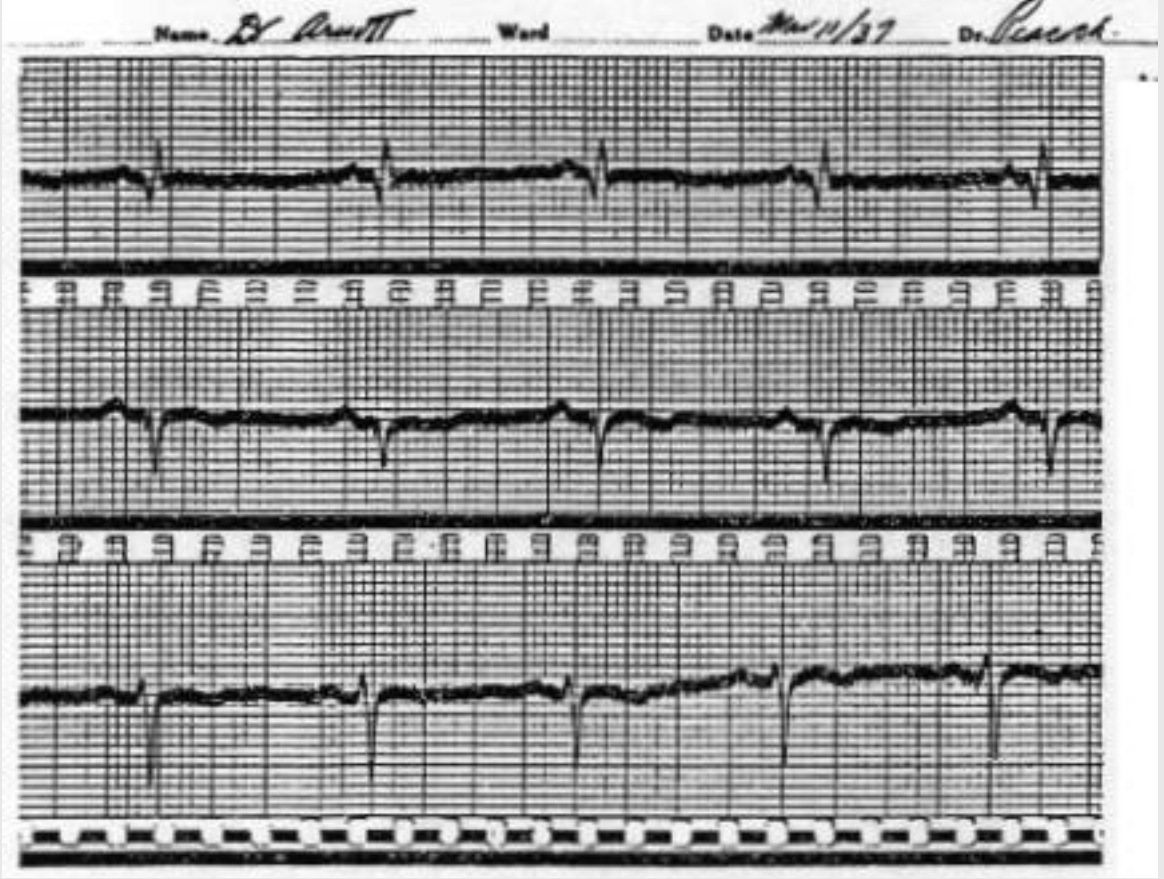
The injury to his vitality had been most far-reaching, and the first ten weeks of convalescence were spent in bed, for the most part. But, long before he was able to be around, he was surprised and pleased to find himself free from his stiff, sore shoulder symptoms.

For a time I had observed his lips were pale or cyanosed when he had become fatigued, but soon after the Glyoxylide was used, this gave place to a normal healthy appearance.

Now, fourteen months since his seizure, he leads a normal, fairly active life, free from any sign of his old coronary symptoms.



First Electrocardiogram taken five weeks after treatment, at a time when pain was fully abolished. It still shows a grave cardiac condition.



Second Electrocardiogram, taken nine weeks after first, when patient was showing recovery from cardiac pathology.

CORONARY OCCLUSION

Patient—Dr. B. —Age 58.

January 1926, 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 alter 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, at last, pain was severe without exertion. Electrocardiogram confirmed the condition of occlusion, and the sclerosis was verified. In January of 1926, I 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. Up to the present time, in spite of heavy work, he does not seem to have aged noticeably.

It seems that in all allergic lesions, the first pathological change seen microscopically is an endarteritis leading to a hyperplastic response of the intima and surrounding structures. The general effect of the destructive injury is hyperplasia in which the vessels show the greatest responsiveness at first. The chancre is the dominant example, but all other members of the group to which cancer must be added show the quality in characteristically lesser degrees. Whether the necrobiotic rays may be fluoresced into mitogenetic rays and so the hyperplastic response be explained, or whether another mechanism be involved, the poisons that can produce allergic lesions can also injure vascular tissue and the attempt at granulation varies from normal more or less. It seems that where arterial sclerosis exists the malignant neoplasms are postponed or inhibited quite perceptibly, and where the inflammatory changes with myocarditis and dilated vessels is dominant, malignancy is favored also. In the first instance, divalent cations dominate tissue reactions more than in the latter, and even though a sclerosis featuring cholesterol deposits are present, the behaviors of this latter substance do not resemble those in malignancy. The two cases of coronary occlusion here reported were primarily arteriosclerotic and both had enlarged obstructive prostates. With recovery, prostate structure and function returned to normal in a major degree. The case of senile sclerosis given below shows the same change in a general and extreme degree; thus, low-grade infection with its prolonged colloid lysis and calcium liberation causing cholesterol deposits.

In contrast to the above vascular picture, the following histories of myocarditis in advanced cases of cancer should illustrate the correction of a different type of vascular pathology by the same treatment. So the reduced oxidation catalysis

may be responsible for widely opposite pathological trends.

CANCER OF UTERUS

Patient—Mrs. M. P. —Age 47. Housewife.

Pre-growth symptoms—Dizziness for twenty years. Double vision with overlapping of objects above each other apparently, from October 1925, to July, 1927.

Past Illness—Cardiac lesion, mitral stenosis, for many years, with consequent cyanosis, dyspnoea, etc.

Present Illness—Started as brownish discharge from uterus in fall of 1925. By June 1926, tumefaction of lower abdomen, pain uterine bleeding and foul discharge. Examination by several surgeons and radiologists were made. Malignant infiltration found so widespread surgery was refused. Radium applied early in November, patient drove automobile then. Fourth radium treatment given on December 30, patient bedfast, had to be moved in ambulance. X-ray then tried, declined in health even more rapidly; hemorrhages, pain and tumefaction increased. Examined at University of Michigan Hospital, diagnosis confirmed, but refused treatment, sent home as hopeless. Two exhausting hemorrhages on May 29, 1927, completed her decline and by June 2, she was in coma. At this time the growth was enormous, filling vagina and compressing bowel, causing abdominal bulging.

Treatment—One dose of Glyoxylide was given June 2, 1927, while patient was in coma.

Results—Within a few days there was substantial improvement. Before the twelfth week she could work a bit in the garden. Within six months all cancer tissue was absorbed, but some radium scars remained which did not clear up until the ninth month. The diplopia disappeared soon after the Glyoxylide was given. She is perfectly normal now; no cancer; health perfect, except for the cardiac function which is greatly improved only.

CANCER OF UTERUS

Patient—Mrs. S. —Age 60. Housewife. History taken May 3, 1932.

Diagnosis—Cancer of uterus involving whole abdomen by exploratory laparotomy.

Heredity—Mother died of cancer at age 88.

Past History—Urethral carbuncle for last eleven years, very painful and troublesome for last two years. Ulcer of duodenum demonstrated by X-ray four years ago. Large fibroids were removed at time of menopause twenty years ago. Four successive attacks of pneumonia more than five years ago. Weak heart for last five years, causing blood pressure to fall from 200 to 160 in last year in spite of increasing toxemia. She became short of breath and cyanotic, her feet and ankles swollen with dropsy. Severe hemorrhages from vagina and pain in the back for the last six months. The abdomen was enormously enlarged with cancerous tumefaction.

Examination—My examination revealed a large transverse and a smaller vertical exploratory incision scar. The whole abdomen bulged from the presence of the large masses of cancer within, to equal that of a full term pregnancy. Thus the stomach, bowel and uterus were all involved and she was suffering hemorrhage because of the malignancy. The large ulcerated Urethral carbuncle was noted and the vagina found well filled with the malignancy that involved the uterus and abdomen. She was weak, cyanotic, short of breath and the heart was so dilated that one was forced to doubt if she would reach home before her heart failed.

Treatment—Two cc. Ketene solution.

Results—Recovery was comparatively rapid, the cancer masses disappeared, the vaginal bleeding stopped and a return to normal was complete by April 10, 1933, when the second photograph was taken. At this time no pathology could be found, every trace of the growths had disappeared, all the stomach symptoms gave way to perfectly normal function and, although the heart action was not as perfect as in the average healthy person, it had improved so much that we considered her

cured. In 1934, she had an attack resembling appendicitis. Her surgeon made an appendectomy and at the same time thoroughly explored the abdomen, and reported to me that no trace of cancer could be found. From last reports we learned that her health was still excellent.

Toxicity of infection expressed as rheumatism, circulatory deficiency, and malignancy of advanced degree, but without definite cardiac impairment is demonstrated in the following case.

CANCER OF RECTUM AND LIVER

Patient—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.

Previous Illnesses—Rheumatism of knees and ankles for the last four or five years. Thirty years ago had an 18-pound fibroid tumor removed with the uterus. Good health since until two years ago when constipation 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. 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, cyanotic 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. The rheumatism likewise was cured.

ADVANCED ARTERIAL SCLEROSIS AND SENILE DEMENTIA PARESIS

Patient—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 intramuscularly. 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. Ice diluted solutions of mixed oxyketenes and Ketenes was used for treatment.

ECZEMA AND ASTHMA

Patient—Miss F. D. —Age 20.

Asthma and eczema since only a few weeks old with brief spells of freedom from one or both conditions. Pyelitis at seven; tonsils removed at five; appendectomy at ten years of age. She had seen all the skin and allergy specialists available with no help, but instead the downward course was uninterrupted. For years she lay on pillows wrapped in cotton for she was denuded of epidermis quite completely with hair and nails affected. Suffering was intense and unending. The asthma attacks came regularly at four a. m., besides at varying periods through the day. A dose of the ketenes was given, August 14, 1937. The response was favorable within five days and progressed cyclically for the better with periods of improvement and reactions intervening at three-week intervals until recovery was completed in June 1938. Complete disappearance of the eczema and asthma was accomplished. In this case the most intense allergy, enduring a lifetime of twenty years, yielded completely to normalcy in less than a year. Three doses were required in this period.

ECZEMA AND PIGMENTED MOLES

Patient—Rev. G. —Age 71.

Had some pigmented moles for many years that multiplied to a great number in the last ten years. They were distributed above the waistline in largest numbers and less below the waist, while below the waist involving the limbs was an eczema that became very severe during the last four years, resisting the most expert services obtainable in various parts of the country. This expresses the situation at time of treatment, November 1928, when a dose of the ketenes was given. In less than a week the eczema had improved very much and in less than a year most of the pigmented moles were absorbed. Traces of moles still remain but the eczema has long ago disappeared. Thus the differences in rates of recovery of different structural allergies, is exemplified.

ENDOCRINE DISTURBANCES

One case reported here has demonstrated hyperactivity of the thyroid gland of highly toxic degree, and another showed a thyroid suppression of many years' duration, both extremes were brought to normal by restoring a normal oxidation mechanism with this treatment. Other gland deficiencies have been corrected in the same way. Femininism and infantilism with undescended testes in adolescents and young adults have been brought to full normalcy and mentally backward children of the pituitary type have rapidly acquired mental efficiency and even brilliancy.

OTHER CONDITIONS

Many other conditions, some of known and others of unknown cause and pathology have responded well to the treatment. The nervous system shows especial predilection to a good response, and thus various forms of neuritis, shingles, epilepsy, and some mental disorders like dementia praecox have done well. The nervous disorders with demonstrable structural change, such as transverse myelitis, multiple sclerosis, the early periods of infantile paralysis and even advanced forms of Glioma have given nice recoveries.

It is in the infections however that the bolstered oxidation mechanism shows best results. Thus in leprosy, and tuberculosis, and even in advanced syphilis, that refused to respond to the conventional methods, we have produced nice recoveries. Chronic malaria, whose ravages compare with those of lues, has responded well. But it is in the acute form of malaria, as well as in other acute commanding infections that we have seen the most brilliant results. Thus a patient following operation on the ethmoid sinus, developed a staphylococcus pyogenes aureous meningitis. In the last stages, the consultant recommended our treatment as an only chance. It proved successful very rapidly. The high fever and coma gave way to recovery, which was completed in a few weeks. A case of rabies in a man who went bad under the Pasteur Treatment was given our treatment when the coma stage was reached and death was impending. He recovered.

One of the most serious factors in our modern civilization is the effects of

anesthetics. The peroxides present are just active enough to produce stable peroxides of certain lipoids, cholesterol and its related compounds for instance. These peroxides are active in the manner we have already described. It is important to overcome their injuries in the manner that this treatment offers. However after the treatment has been used in a serious infection or in cancer, the use of an anesthetic may play havoc again, and in a manner that is not so quickly overcome by repeating the dose of catalysts, as in the first instance. Therefore all surgery should be avoided after our treatment when possible. We interpret the high carcinogenic activity of ether extracts of wheat germ, as due to the presence of peroxides of stigmasterols, produced by the ether peroxides. The quinones that can also be produced offer a pathogenesis as we have described earlier. The reason so many cancer cases and infected cases decline so rapidly after operation finds its explanation partly in the effects of ether peroxides on the tissue lipoids and their resultant effects on the body metabolism. Both the support of active leukocytosis accomplished by the ketenes, and the support to the completion of the oxidation powers of the leukocytes and the cells of the reticuloendothelial system, accomplished by the oxyketenes as explained in the formulae of origin and activity are essential to the most efficient recovery.

TREATMENT REGIME

The diet should be selected to give adequate nutrition in dynamic factors but to avoid tannin, the terpenes of fruit skins and the acids that rob the colloids of their cations. These acids are mainly tartaric and oxalic. Animal proteins should be avoided because they supply the bacteria of the colon with nitrogenous material from which to make toxic amines, amides that inactivate or destroy the catalase and peroxidase of the tissues. Vegetables and fruits and whole grain cereals serve excellently. Narcotics and anesthetics of all kinds should be avoided if at all possible, for they injure the dispersion of the colloids and interfere with action of the co-enzyme hydrogen acceptor systems of oxidation. Aluminum utensils are prohibited on the same basis.

Colon lavage should be sufficient to make up for any elimination defects. Milk of Magnesia can be used when required for catharsis.

The injection of the catalysts should be made intramuscularly after a few days of colon lavage and liquid diet of apple and pear juices and the raw or cooked vegetable juices, after which the solid diet is resumed. The injection may be repeated twice at fourteen-day intervals; of if a reaction or improvement is observed after the first or second injection the other may be omitted. Some of the examples cited above were given different members of the group of oxidation agents for purposes of observation. But for routine, we use the whole mixture as evolved in aerobic glycolysis. Thus each case has a chance to receive the catalyst most concerned in his particular deficiency, as well as every other member of the group because all are evolved in the polymerization process co-extensively with the degree of malignancy expressed by the growth. When polymerization is so vigorous and extensive as to produce melanines also, we have observed both the greatest degree of malignancy and the quickest recovery rate as well. This holds also for other allergic lesions productive of pigmentation like the gumma.

It should appear from what has been said that in the development of a great variety of diseased states the primary causation factor is a reduced oxidation catalysis. Therefore, the measure that corrects this defect removes the basis for secondary factors of causation and must play the fundamental role in the recovery from all diseases, be they infections, allergies, or metabolic disturbances. Indeed, there is but one essential pathology, no matter what clinical picture the secondary causes are able to produce, and thus the complete correction of each of them depends upon the same activity, the restoration of an efficient and sufficient oxidation catalysis. This is possible only by the action of a catalyst that is more labile and more energetic than any of the disease-causing toxins, hormones, vitamins, or other physiological catalysts. This quality will never be found in any molecule in greater degree than it is present in the substances we have presented here. This statement is not rash for they fit the situation no matter which course the pathogenesis takes and there are no other possibilities except certain nitrogenous compounds we are experimenting with at present in the pathogenesis mediated by the imide group in certain vital nitrogenous bodies, and in the manner discussed above. So the success in the fight against disease in general will be found to depend upon the expertness with which these substances are

employed.

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