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OF THE
CANCER PROBLEM

BASED ON AN ENQUIRY INTO

The
Bio-chemical and Radio-active
Properties
OF
Living Matter.

AND

their chemical and physical relation to
The Cancer Inducing Agents.

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“ Man suspects a Cause for every Law and is disinclined to acknowledge the existence of a Law unless he can account for the Cause of it.”

Prof. L. Meyer.

“ The plans of the structure of nature are locked up in the Atoms themselves, they are full of wonder and mystery because from them alone and what they contain grows the infinite variety of the World.”

Sir W'm. Bragg.

“ Science is a System of Knowledge built up by the concentrated thought of generations of acute inquiries ”

Canon Streeker.

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“ A Man of Moderate Attainments may be serviceable to those that have Greater Degrees of Knowledge, for though they have the greater Capacity yet have they not Leisure nicely to Enquire into these matters.”

R. Nelson, 1703.

THE completion of this work was delayed owing to a serious riding accident to the Author, which ended fatally after nearly two years of acute suffering, in December, 1930.

The book was finished a few days before the end, but the final revision had not taken place, which will account for any errors or repetitions.

F. WOODROFFE-HICKS,

The Gateway,

Langport.

April 2nd, 1931.

A NEW LINE OF CANCER RESEARCH.

Introduction.

IN PRESENTING a line of Research differing essentially from any that has hitherto been put forward, the writer must inevitably incur the charge of presumption, but who will regard such a charge when not merely a nation, but civilization is faced with what has been termed the "*direst woe.*"

Let it be said at the onset that the writer is not a Student of Medicine, but of Chemistry and Physics, one who has been engaged for the past seventeen years in an endeavour to pierce the mystery of the *Evolution of Matter* and of those phenomena which are involved in *Metabolic* change.

The Solution of the Cancer Problem here put forward is based not alone on biological and physiological facts, it has its foundation in irrefutable scientific data—in facts that are not the mere hypotheses of speculative minds—but Scientific truths built up by generations of scientific enquirers—and crowned by the Researches of the brilliant band whose discoveries will forever make this century glorious.

I refer to the epoch-making discovery of a "*New Property in Matter,*" a discovery which has not as yet perhaps sufficiently penetrated beyond the confines of the laboratories, but the true objective of which lies beyond the laboratory, and which conveys, or so the writer believes, nothing more or less than the explanation of those mysterious phenomena which surround the processes of organic growth, phenomena which have hitherto been regarded as impenetrable secrets. The fact that Cancer research has up to the present time been unsuccessful in finding any clue to the origin of the disease or its treatment, forces us to the conclusion that the solution of the problem **does not lie in the local line of investigation hitherto adopted, but, rather in research into those Primary and Constitutional Causes, by which all living Matter is built up and energised.** *Constitutional Research* has been too long neglected and though some may think that the sciences of Chemistry and Physics are remote from the problem of cancer, investigation shows that these twin sciences afford the clue to the mystery of malignant growth. Cancer has proved hitherto an impenetrable secret, but with the great discovery of the *radio-active property of Matter* we are introduced

to a line of research which leads directly to a logical interpretation of the Problem of the Growth of Matter.

Can it be said that the epoch-making discovery of the vital property contained in the Atom itself has as yet influenced our idea of "*living substance?*"

Has it as yet found practical application in regard to the solution of problems affecting living bodies? For example such problems as abnormal growth—notably cancer?

Has the knowledge of a "*new property in Matter*" served to modify in any degree our conception of the value of the treatment of certain forms of disease by radio-active measures?

To these the answer appears to be in the negative.

The "*new property in Matter*" has not seemingly influenced our conception of the growth of the body, its substances or its functions.

This is the more surprising since the aim of all true science is unity and simplicity, the new discovery provides an explanation which embraces both these attributes.

Hitherto our conception of the body has lacked both unity and simplicity.

No basal principal has ever been advanced which offers a broad and rational basis for its manifold phenomena and indeed so little has any root principle determining *vitality* been established that some have argued that to believe electricity or *vitality* could play the part of "*efficient cause*" was absurd.

The new knowledge of an unexpected property in Matter obliges us seemingly to very carefully consider what we had thought the foundations of organic life.

A new and startling factor has entered our calculations and the mind of man which has so long craved "*an explanation of the Matter out of which the Universe is made*" (J. J. Thomson) has at last received an answer shattering in its profundity and blinding in its very simplicity.

The vastness of the Universe, its substances, activities and phenomena have been interpreted for us by the microscopic forces that dwell within the Atom.

The Atom has become the interpreter of the "*infinite variety of World,*" Matter and Energy are interpreted, the indissoluble link that unites them is at last made manifest.

Prout and Crookes speculated as to the possibility of "*primordial substance*" in place of a primordial substance we find a **primordial energy, by which not alone substances, but elements are transformed and translated.**

Hitherto we have possessed no clue to the secret processes that determine the vital phenomena of the body. Such problems as Living Matter, its Structure and distribution, Embryology, Morphology, Reproduction, Transformation, Heredity, Evolution and Animal Heat have been more or less factors connected by no Common Principle; the result of no known System or Basic Law.

These phenomena are, we now see, united in a Universal Principle, a principle which is in harmony with all we know of Natural Laws. The discovery of the radio-active property in matter remakes and remoulds all Scientific thought, **but it is in its more immediate**

relation to living organisms that we are called upon to recognise its Dynamic importance.

The discovery that is the lodestar of Science, is the starting point of a new and startling development in Biological and Physiological research for it is by the aid of the new knowledge that we find the key to the problem of many forms of acute disease, above all to the most dreaded and cruel of all scourges, the abnormal cellular activity that we call Cancer.

Too often long custom exercises a tyranny over the mind, forbidding the reception of a new idea. New Ideas of necessity appear revolutionary, but better that should incur reproach, than that which a modern writer has summed up as "*a condition of complacent ignorance.*"

It will be admitted that for over fifty years Research has centred on the *local* aspect of malignant growth, it has been concerned with an inexhaustible examination of the final stage of the disease, i.e., *excessive cellular proliferation.*

There appears little evidence of any attempt to solve the problem by the light of recent Science, indeed it is not too much to say, that so far as Cancer is concerned Science stands where it stood half a century ago. Is it not due to this fact that research has been barren of result and that in spite of monumental labours, devoted investigations and brilliant experiment, the origin, cause and treatment of cancer remains unknown.

Again and again brilliant discoveries have encouraged the belief that the origin and cure of Cancer had been discovered. Amongst the most important of these were those of Professor Virchow, who in 1848 startled the world by his researches into cellular pathology.

Yet great as were those researches it cannot be said that they advanced our knowledge of the origin, cause and treatment of Cancer, and indeed we sometimes ask ourselves, how far the knowledge of cancer has advanced since John Hunter at the close of the eighteenth century promoted "*A Society for the Investigation of Cancer.*"

The outstanding problems concerning cancer remain unanswered. The secrets of immunity, susceptibility and heredity remain unsolved. It is true a number of agents have been observed to be causal factors of cancer, yet their precise influence has not been determined and the very variety and contradictory nature of these agents has obscured the issue.

Experimental Research has conspicuously failed.

Statistics conclusively show a high cancer incidence and mortality in certain occupational groups, amongst which are conspicuous the metal and aniline industries, a high incidence is also noted amongst petroleum, tar, pitch, salt and soot workers. **The very diversity of these agents has proved one of the greatest stumbling blocks to determining the nature of the influence they exert on living Matter.** It has been thought that the very fact of their diversity rendered the value of their acceptance as cancer-inducing-factors problematical.

But it is here that Science steps in and provides an explanation, the discovery of a "*new Property in Matter*" proves that Agents seemingly diverse are in fact fundamentally and essentially united. These cancer-inducing Agents are one in the possession of a common principle—that of inducing Heat, and thus each of these Agents induces the same malignant influence on the blood.

In a recent address to Medical Students, the *Dean of the Oxford Medical Schools, urged on students the necessity of scientific study, for said he, "*it is on the scientific side of medical education that the greatest blot remains.*" That this criticism is not wholly undeserved, we cannot doubt when we realize the explanation science affords to otherwise inscrutable problems.

The fact that the Sciences of Chemistry and Physics have shown that a common root-factor unites all the cancer-inducing-agents provides us with one of the most valuable clues to the nature of cancer and its treatment. For we now perceive that those problems which have hitherto rendered the Solution of cancer so obscure, receive not only a new interpretation, but an interpretation that is at once both logical and connected.

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HEAT.

A close investigation of the chemical and physical effects of intensive heat on the processes of growth and the development of the body cells and tissues, reveals the fact that the constant association with elements which induce heat procures conditions which are utterly opposed to the maintenance of the normal balance of the chemical and physical operations which control organic growth. Heat induces abnormal conditions, and energy is procured of a nature inimical to normal growth. Cellular activity is accelerated and the balance of chemical exchange suffers accordingly.

The bombardment of cells and tissues whether healthy or unhealthy by powerful heat-inducing factors exceeding that to which the body is adapted, inevitably procures conditions which are chemically, physically and biologically destructive. The more deeply we examine into the nature and processes by which in living bodies normal healthy growth is attained, the more evident does it become that association with all elements productive of great heat are a menace. Thus we are led to enquire whether a Heat-inducing Element such as Radium, though affording a temporary alleviation, by burning away the obstructive growth, must not in the light of the new knowledge be regarded as a danger, since it serves to accelerate and increase the adverse chemical conditions which are the root cause of malignant growth. More particularly is the danger apparent when intensive heat is applied to those regions of the body, where the most profound and complex chemical processes take place.

In less than a quarter of a century research has transformed the whole world of Chemistry and Physics and it may constitute a matter of surprise to future generations that while the discovery of radium and X-ray have been widely applied to the treatment of disease, these great discoveries have hitherto wrought no fundamental change in the conception of the energies of the human body, its physical changes and functions. Neither have these great discoveries vitally accelerated research into those fundamental antecedent causes by which the body is built up.

* Dr. Ainley Walker.

The writer can only here attempt to briefly outline the causes, chemical and physical, which render the treatment of cancer by radium a matter for profound disquietude, more particularly when the growth occurs in the regions where complex changes are continuously in progress.

A survey of the more important investigations in regard to Cancer Research as recorded in the Press and Medical Journals during recent years reveals the astounding and disquieting fact that no "*angle of research*" appears to include either chemical or physical investigations.

In an Age when chemistry and physics are the ruling force which dominates every trade and industry, an Age when the Mystery of Matter has at last been revealed, it is the more astounding that with the one exception of Dr. Warburg of Berlin, there appears little evidence of investigation resting on a scientific basis. The Scientific side of the question seems to have been ignored, and it is not too much to say, that it is due to this fact that the discoveries of Dr. Virchow, Dr. Fibiger and others have failed to justify the hope that they would advance our knowledge of the origin of cancer and of its treatment. These researches lack the essential foundation on which all the investigation of living Matter must ultimately rest, i.e., the sciences of Chemistry and Physics. Thus in spite of prolonged and elaborate investigations, co-ordinated research has failed to discover the cause of cancer or to determine a line of treatment.

It is to the great discoveries of the past united to those of the present that to-day we have given into our hands the key that unlocks the profound and mysterious processes that underlie generation, energy and evolution.

For over eighty years research has been practically if not wholly confined to the *local* manifestation of the disease, instead of investigation into the chemical and physical factors which induce and control the growth of Matter.

From time to time suggestions of a more or less hypothetical nature have been advanced usually unsupported by medical or scientific data. For example, recently an American writer has suggested that an increasing prevalence of cancer amongst motorists is due to the presence of tar on the roads. Another writer attributes cancer incidence amongst mill hands to the stricture caused by tight clothing. In no case do the hypotheses advanced appear to be linked by any common causal factor, or to be based on any scientific foundation.

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Very recently the Press and Medical Journals announced that the British Medical Association had launched a "*new War on Cancer*" which it was hoped would have the effect of solving the cancer problem. It was stated that between September, 1929—September, 1930, 20,000 doctors would be engaged in a special watch on cancer cases, and from the Reports to be sent in great hopes are built.

It was, therefore, with feelings of profound disappointment, indeed of dismay, that a perusal of the Forms to be filled in showed that this investigation is limited to what is known as "*the accessible regions*," and further that the *questionnaire* contains no enquiries in regard to the bio-chemical and bio-physical aspects of the cancer problem. Neither

is there any reference to the chemical and physical changes that may be expected to follow the introduction of intensive heat such as X-ray and radium on living cells and tissues.

This omission indicates that up to the present the chemical and physical aspects of the cancer problem have not been seriously considered and **the writer suggests that until extensive research into the chemical and physical effects of intensive heat on cells and tissues is undertaken, it is impossible to venture any opinion as to the beneficial effects following the application of Radium or X-ray, on the contrary its application seems to be fraught with considerable danger.**

A Medical correspondent recently announced in the Press that while admittedly the cause of cancer remained unknown, it was nevertheless fortunately possible to treat malignant growth successfully by radio-therapy. This optimistic belief is surely opposed to the commonly accepted dictum that the antedote to a poison can only be successfully administered when the nature of such poison is determined. **The belief that a remedy of such a nature as radium can be safely employed in the treatment of a disease, the origin of which is unknown can only be regarded in the highest degree dangerous and indeed subversive to the principle on which for countless ages the science of Medicine has been built up.**

A survey of cancer research extending over a period of some eighty years shows that extensive as investigation has been, it has been limited to one aspect of the problem only, that is to the *local* aspect of the disease as manifest in its final stage, i.e., *cellular proliferation*.

The present writer ventures the opinion that to this cause must be ascribed the total failure to discover the origin of cancer. Investigation convinces that to understand the principle of excessive growth there must be primarily an examination into the nature of the causal factors chemical and physical, by which all organic growth, whether healthy or unhealthy, is built up.

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Since the beginning of this century great strides have been made in our knowledge of bio-chemistry and bio-physics. There is a more general appreciation of the part that chemistry and physics play in regard to organic life, yet the logical application of these sciences to the processes by which the living body is built up has not as yet been seriously considered. **Yet surely there must be an ever-increasing perception of the necessity of co-ordinating the twin sciences of physics and chemistry if progress is to be made in comprehending not alone the *composition of protoplasm*, but of comprehending the particular processes and conditions which dominate the chemical exchange of the body.**

The importance of protoplasm as the foundation of all Cancer research is indicated by the fact that it forms the physical and material basis of all life, whether it be the human body, the amoeba or the vegetable world.

* * * * *

Growth, development and reproduction are the phenomena which distinguish every form of life. Healthy growth and development are the result we must conclude of an ability to attain and maintain the necessary equilibrium which procures in the body chemical exchange. If this is so, then abnormal and unhealthy growth must be ascribed to a failure to achieve this equilibrium.

Cancer appears to be an extreme instance of the unhealthy conditions which arise from an inability to maintain the chemical balance which is the essential factor of perfect cellular development. The key to the origin of cancer, would seem to have been too long sought in *local* factors, the microscope has been relied upon to disclose secrets which can only be revealed in the laboratory of the chemist and physicist. If we would determine the nature of cancer, inquiry must be lifted from *local* investigation and must be transferred to the fundamental processes, chemical and physical, which are the basis of all organic growth.

For the past three years, the writer has been engaged in traversing the truly monumental results of eighty years of cancer research. The great discoveries of Professor Virchow, in 1848, turned all attention to cellular pathology, and since that date cancer research has focussed almost entirely on the *local* aspect. For eighty years co-ordinated research has centred on the pathological, microscopical and bacteriological aspects of cancer. Not alone in Great Britain and in the Continent of Europe, but in the United States, in the Colonies and in Japan exhaustive researches are being undertaken on these same lines, yet in spite of the hopeful statements which constantly appear in the Press, in spite of serums, grafts and widespread experimental investigation, the result of nearly a century of research has been a complete failure to determine the cause and origin of cancer, or to decide on any form of treatment. To-day those who are best qualified to judge tell us that research has thrown no light whatever on the origin of cancer.

Does this mean that cancer is a scourge fastened on humanity from which there is no escape? Or does it mean that research has centred in the wrong direction and that the time has now come when *local* investigation must give way to investigation of the *constitutional* causes by which all organic Matter is built up?

* * * * *

A New Property in Matter.

This century has been illuminated by the most startling flood of light that has ever been flung on scientific research. The amazing discoveries of a brilliant group of scientists among whom stand pre-eminent: Sir Ernest Rutherford, Sir J. J. Thomson, Niels Bohr, H. C. J. Moseley, G. N. Lewis, I. Langmuir, Professor Andrade and Sir William Bragg, have ushered us into a new World and given us a new conception of the Elements of which Man and the Universe are alike built up. I refer to the discovery which will rank for all time as the most outstanding in the history of Science—the discovery of a “*New Property in Matter.*”

This profound discovery has revolutionised science, yet strange to

say it has not as yet accomplished its true objective, the explanation of the growth of Matter. So far this discovery appears to be largely confined to the laboratories, yet the "*New Knowledge of Matter*" not only revolutionises our conception of Organic life, but it affords an insight into the nature of the vital force of the Universal Law, by which Matter is evolved and growth controlled. It throws a new light on the problems of the body; it furnishes an explanation of disease notably of cancer; and provides a logical explanation of some of the most complex questions that man has ever been called upon to solve.

By the light of the new knowledge of Matter, we now perceive the causal factors at once simple and profound by which from simple Elements all organic life is built up and by which *cellular growth* and *proliferation* is accelerated. We perceive also in what direction lies the hope of prevention and cure of disease. The new knowledge of Matter brings home with peculiar force what we already knew that the living body is a miniature laboratory and that every process, function, and activity is the direct outcome of chemical combinations and interactions as exact and precise as those on which the chemist relies for his simplest as for the most complex experiments.

The new knowledge provides an explanation for those "*bio-chemical adaptations*" of which Professor H. F. Osborn has said "*we have at present no conceivable explanation as to causes.*"

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The Atom.

The modern hypothesis concerning the structure of the Atom, the increased knowledge of the Atomic numbers and weights, the discoveries of the ratio-activity of substances, and the apparent relation existing between certain Elements, but above all in the startling discoveries of Rutherford and other pioneers of science in regard to the structural arrangement of the Atom, suggested to the writer in 1927 that it was in the Atomic structure that the clue must be sought to the problem of vital activity and that in the Atomic Universe must be concealed the explanation of the eternal riddle of *chemical exchange and chemical constancy.*"

The writer believes that the great discovery of *Atomic energy*, the discovery that the Atom is a complex body and not as had been believed—*indivisible*; the extended knowledge of atomic weights and numbers has brought us at last to the threshold of those fundamental processes which determine the nature of life and the evolution of Worlds.

The writer suggests that the most recent research into the *dual nature of the Atomic structure* obliges us to reconsider this opinion. The structural peculiarities of the Atoms of every element appear to very conclusively indicate that the "*vital energy*" that builds up protoplasm is the inherent and inalienable constituent of every atom, and that thus each single chemical substance must be considered "*living*" in the sense that it has vital force since

research has revealed the amazing fact that each single atom possesses its own precise, unchanging, and individual charge of electricity and that it is as a result of this electric charge assigned separately to each atom that the eternal mystery of energy and of chemical combination is achieved and maintained in every living organism. It is due to the new knowledge of the electric charge that accompanies the Atom of the several elements, that the writer postulates has provided a new insight into the fundamental processes which build up all organic life. This great discovery the writer believes, provides also the clue to the origin of cancer.

The clue which the microscope was powerless to reveal, the chemist and physicist have laid bare.

The hypothesis first formulated in February, 1927, has been confirmed by two years of plodding investigation, what in 1927 was hypothesis may to-day be regarded as a reasonable and logical conclusion based on the mathematical ratio which exists between the atomic numbers and the atomic weights of elements and which receives further confirmation from the researches of recognised pioneers of Science. In the structure of the Atom is found the missing link that unites with definite and irresistible logic the chain of evidence that binds together under one Universal Law all living organisms. In the Elements and in the Atoms that compose the elements, we perceive the Alpha and Omega of Life; Evolution past, present and future, Material evolved through the slow cycles of Time, living forms moving onward and upward in progressive stages to fulfil an ordered Design. Worlds past and Worlds to come built up and furnished with living forms, in obedience to the hidden Law of Energy. The "*vital force*" whose law we read in the Atomic structure would seem to know no confines to include all Systems, Worlds and Substances. The designed causes that control material things, the force that provides heat, that gives to *chemical constancy* its *stability*, and to the body its laws.

The Atomic World has shed a new light on the human body in the fundamental factors that provide health, it furnishes the logical explanation of the problems of malignant growth and with it a reasonable hope of cure.

We have long known that each delicate process of the body must be the direct outcome of combinations of great chemical exactitude, processes by means of which growth, virility and fertility are procured, but the new knowledge of the conception of Matter presents yet another aspect of the problem of growth.

We now perceive that all growth is procured by the combination of certain simple elements and that chemical interchange and transformation may be hindered, accelerated or even destroyed by association with certain elements foreign to the body's needs more particularly of elements possessed of high radio-activity such elements introduce changes of temperature. The writer's investigations lead to the conclusion that all chemical transformations are dependent on the vital question of temperature, i.e., the maintenance of definite balance between heat and moisture,

The new knowledge has indicated that all Matter, living or inert, is endowed in a greater or less degree with radio-activity and the Atom which has been regarded as a negligible particle is now found to be a complex and divisible body, the activity of which determines all chemical processes, hindering or accelerating as the case may be. The discovery is one which must for all time rank as one of the greatest in the history of the human race. The portentous discovery that the Atom is possessed of its own powers of radiation, whether it be the Atom of Hydrogen with its one Electron or whether it be Uranium with its ninety two electric units it is the Atom that rules both the Universe and Man.

The Atom reveals to us a new picture of organic life in which every Order and Species is determined and controlled by the power of radiation with which it is endowed. At the head of organic life stands Man, an individual possessed of great radiological powers, a being which while allied in basic composition to every other form of life, however lowly, is differentiated from all other species by the fact that he is endowed to a greater degree with those particular elements which are possessed of high radio-activity, i.e., vitality. From these facts the writer has been led to formulate the theory that in the new discovery is disclosed not only the direction in which fundamentally the evolution of Species and Matter have proceeded, but further it suggests that the failure to establish evidence by experiments on the lower forms of life is due to the fact that the analogy between Man and the humbler Orders is too remote to provide a basis on which to rely for exact conclusions. Thus experiments on fowls, mice or rats, the eggs of the sea-urchin, etc., though biologically interesting can never provide a basis for exact conclusions in regard to a problem as complex as cancer. That all forms of life have a fundamental affinity is evidenced in protoplasm, but exact conclusions cannot be drawn from experiments on species which are chemically and physically remote.

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The momentous discovery of the radio-activity of Matter both organic and inorganic, did not become known to the writer until February, 1927, it fell with peculiar force upon a mind, prepared by fifteen years plodding research into the mysteries of the evolution of Matter and Metabolic change. It was perceived that **in the perfectly astounding fact of the *New property in Matter* a vast revolution, not merely in science, but in the treatment of disease was at hand.** The nuclear theory of the Atom afforded not only a new insight into the properties and activities of elements, but it suggested an explanation of the chemical and physical changes which occur in the living body more particularly into the problems of growth and fertility.

The writer realized that the new knowledge of the radio-activity of Matter opened up a new channel of research, more particularly into the processes which determine growth, both normal and abnormal, and that in particular it might provide an explanation of the peculiar influence exercised on the living body when brought into contact with elements of high radio-activity.

The present paper is an attempt to draw attention to these facts, more particularly to invite research into the effects and influences

exerted by radium, X-ray and indeed of all elements possessed of high radio-activity on the chemical processes of the body. In the light of the new knowledge it seems evident that the failure to discover the *origin of cancer* is due to the fact that research has concentrated on the final stages of the disease, *cellular proliferation*, rather in research into the *constitutional* causes by which all Matter is made up.

The electrical "*constitution of Matter includes practically the whole of the twentieth century physics.*" The history of the slow development of the idea, is one of the romances of Science. As long ago as 1756, Franklyn conceived the idea of the electric particle, Farraday, Crooks, Thomson, Milligan, Rutherford, Niels Bohr, and others have followed and built up by experiment a definite foundation, but the full force of this discovery is only appreciated when we view its bearing on the problem of the growth of living tissue.

It would appear that the chemical and physical properties of all Matter is determined solely and only by the number or mass of the electron particles it carries.

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The utility and final test of all research admittedly lies in its ability to solve problems. Reference to the Cancer Research Records of the past eighty years show that the outstanding problems of the disease remain unanswered.

We have, therefore, to ask ourselves whether this failure is not due to the fact that the wrong line of investigation has been pursued. It is difficult to believe that nearly a century of earnest investigation should prove a total failure unless an entirely wrong line of research has been undertaken. Can we be content to see the alarming increase in this disease and to hear of the millions of money expended on treatment which is unquestionably a failure, if we may judge by the Statistics and Reports annually published by the Cancer Research Organisations.

Let us take some of the commonest questions which remain unanswered after nearly a century of research :—

Is cancer hereditary ?

Is cancer infectious ?

Is cancer contagious ? And if not—why not ?

These questions *local* research have failed to answer.

The new line of investigation shows, that cancer is neither infectious nor contagious, because it is a disease which depends entirely on the individual state of the blood.

Again, the important question as to what constitutes immunity and susceptibility remains unanswered.

Here, again, we find it is a question largely dependent on the condition of the blood.

Again, research has failed to determine or explain the question of 'site,' and while it is stated that in both men and women the commonest 'site' is found to be the 'digestive organs,' for this no explanation is advanced,

The new line of research indicates that cancer is commonest in the digestive organs, this is due to the fact that it is here that the greatest amount of chemical exchange takes place, and it is due to this strain, coupled with an inadequate blood supply, that this 'site' is most common.

Again, Statistics show a high cancer incidence prevailing in certain occupational industries, notably in the lead trade, why is this? Research has provided no answer.

The new knowledge proclaims without hesitation, that not only in the lead, but in all metal trades and others, where elements are employed of high radio-activity, the same harmful influence on the chemical changes of the blood prevails.

Here, again, the 'site' is found to be in the part of the body which is brought into closest contact with the metal and element.

It has been observed, that not only in the metal trades, but amongst paraffin, petroleum and aniline dye workers, a high cancer incidence prevails as also amongst those engaged in handling substances as widely different as salt and soot.

The wide divergence in these cancer-inducing-agents has proved the great stumbling block to determining what are precisely *the inducing factors*, so much so that many investigators have been led to believe that they cannot be regarded as cancer-inducing-agents. The knowledge of a "*new property in Matter*" has, however, provided the solution of the problem.

The writer's researches indicate that those agents, though apparently diverse and dissimilar, are in reality united by a common root-factor. Each is endowed with the power to induce heat and thus to withdraw moisture from the tissues.

The writer's investigations lead to the conclusion that the withdrawal of moisture from the cells and tissues is a definite and irresistible cancer-inducing-factor.

Again, comes the all important question of the value of radio-logical treatment of cancer. Is it of value or is it the reverse? The considered opinion of experts in regard to this question appears to have been answered by the fact, that in this country alone, the sum of over £300,000 has been already subscribed for the purchase of Radium and that the radiological treatment has been universally adopted.

Yet with the new knowledge of the radio-activity of elements, it is impossible to resist the conviction that the application of intensive heat to the delicate tissues of the body, though temporarily relieving pain by removing growth, must inevitably by withdrawing the moisture upon which every chemical change of the body is dependent, procure a far-reaching danger. This condition, commonly referred to as "*spread*," is an inevitable result of the application of radium to living tissue.

The new knowledge provides the simple explanation, "*Spread*" has been brought about by the withdrawal of moisture, the nodules which commonly appear in the surrounding fibres are due to the fact that the blood has been deprived of its essential moisture,

In this connection the writer conceives is found the answer to another of the important but unsolved problems of cancer, viz.,—Why has the radiological treatment of facial cancer and cancer of the mouth and tongue proved more favorable in its result than the radiological treatment of cancer in other parts of the body?

The answer is, that in the face, mouth and tongue continual contact with the oxygen in the air, and in the mouth the moisture continuously provided by the saliva, serves to counteract the danger inflicted by intensive heat—whereas the withdrawal of moisture from those regions of the body in which the most extensive and delicate chemical exchanges continuously take place, such as in the breast, digestive organs and cirvex, radium exerts an influence which can only accentuate the conditions which procure and spread malignant growth.

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The writer is advocating that cancer research shall be removed from the *local* to the *constitutional* point of view, this is supported by the fact that the New Line of Research has already furnished logical answers to most of the unsolved problems of cancer. A few of these problems are touched on in this Introduction, but, others of profound importance are dealt with in the Paper to which this is the Introduction. Most will agree that since *local* research has failed to solve any one of the vital problems of cancer or to devise means curative or palliative to deal with the disease; the time has come to turn our attention to a more fruitful line of Research.

Up the Stairway of the Ages men have pressed, content to pass out of sight unrecognised, might they but build one grain of Knowledge into the Step by which those who come after should find Truth.

APPENDIX.

It may be stated, the writer submitted a Paper ("Cancer and the Electron System") embodying the principles here set out, to the President of the British Association at the Annual Meeting in September, 1927.

The writer realized the paper was inadequate.

On the advice of the President, however, it was submitted to the President of the British Medical Association, who, in a letter of October 3rd, 1927, acknowledged the Paper as "valuable" and as "a delicate and refined investigation" and suggested that it should be laid before the Councils qualified to examine such matters. Accordingly the Paper was laid before the Imperial Cancer Research Fund. The Director "was, however, unable to recommend it" to the Council and the matter dropped. Later, however, as a result of encouragement from qualified medical and scientific men, the attempt was made to arouse the attention of the Cancer Research Councils, through the International Cancer Conference and the present Paper was commenced, but before its completion the writer was disabled owing to a severe accident and thus prevented from further work. Consequently, a Paper embodying some of the Principles the writer here outlines was laid before "The Advisory Committee of the International Conference." This was duly acknowledged in July, 1928, and referred to as "a valuable contribution to Cancer Research." Regret was expressed that the Paper arrived too late to include in the Conference Proceedings.

A few months later the Secretary of the Conference made request for the return of the Paper that "it might be dealt with without delay." It was further stated that the Paper "had not been selected by the International Conference Committee," but "it had been intended to pass the document for submission to the Investigation Committee." The writer was not able to comply with this request as the Work was under revision.

It may be stated that the writer had received an invitation to read the Paper before the British Association at Bristol, 1930, but was prevented by the serious illness referred to.

COASBY & Co. Ltd.
Printers,
St. James' Road,
SOUTHSEA.