A FURTHER STUDY IN THE NATURE OF DISEASE

by

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INTRODUCTION

HAVING become and remained a student of medicine ever since I qualified in 1906, my career (in this branch of the larger oecological one of science) has differed in many respects from that of my contemporaries. I was prompted to become a student of medicine on qualifying by my love of the country and its flora and fauna, especially the flowers, and my inability to understand what I was being taught at school. I had to learn everything for myself, and in the process of making considerably more mistakes than my school-fellows, I learnt early in life not only that many of my teachers did not understand what they taught, but also that they expected their pupils to believe what they did not believe themselves.

Whilst a medical student I went through a period of hero-worshipping, as I imagine most students do, particularly when they see their teachers practising their craft instead of only teaching it, which is all that schoolmasters are required to do. My hero-worshipping was more of the surgeons than the physicians, between whom I thought I saw the same differences as I had been accustomed to see at school between the classical and the mathematical masters. The classical masters and surgeons always struck me as being greater men than the mathematical masters and the physicians, despite the latter being generally the more learned. My greater hero-worshipping of the surgeons determined me early as a medical student to become a surgeon rather than a physician. But this end was destined never to be reached owing to a mistake I made while I was a house-surgeon. This mistake led me to specialize in the so-called 'skin and venereal diseases', the branch of medicine in which I happened at the time to be most interested. I went to Vienna to learn German and to increase my knowledge of dermatology and syphilology. The part of dermatology which I found most interesting was the histology of the various skin lesions. Indeed, this interest was the one which made me combine clinical and laboratory work, a practice from which I have never since departed. I soon extended this practice in an attempt to find the answers to the questions raised by clinical work in connection with what may be called, for short, the 'syphilitic trilogy'. The acceptance of the *Spirochaeta pallida* as being the cause of syphilis, of a positive Wassermann reaction as indicating an active syphilitic

infection, and of arseno-benzene as exhibiting a lethal action on the causative agent of the infection, failed to answer a single question asked by the clinical condition.

The study of the histology of the various skin lesions showed there to be a greater similarity between them than the naked eye can perceive between the so-called 'skin diseases'. Put in another way, a diagnosis of a particular cutaneous manifestation of disease can generally be made more correctly by relying on one's own eyes, or on a macroscopic examination, than on a microscopic examination of a section. Further, I learnt that neither a macroscopic nor a microscopic examination throws much light upon the cause of the eruption. The attempt to find the cause, or causes, of the so-called 'skin-diseases' was one of my introductions to what I called later the 'nature of disease'. Another introduction came through finding that the *Spirochaeta pallida* is the male phase of a coccidial *Protozoon*, and that the spore phase, which contains the female element in addition to the male one, is the actual cause of the infection. I found also that the Wassermann reaction is a non-specific one, and that a persistently positive reaction may more easily be rendered negative by treating the patient as a whole than by continuing to prescribe anti-syphilitic treatment. And that anti-syphilitic treatment acts only indirectly upon the causative micro-organism through the blood, and that its injudicious use may actually increase the pathogenic activity of what I call the '*Leucocytozoon syphilidis*'.

The total result of this combined clinical and laboratory work on the so-called 'skin and venereal diseases' was to convince me that the cutaneous manifestations are in the main the result of the abnormal chemico-physical changes which intestinal toxaemia makes the protein in the blood undergo; that the syphilitic manifestations are the result of the abnormal chemico-physical changes which the *Leucocytozoon syphilidis* makes the protein in the blood undergo; and that the anti-syphilitic preparations act by correcting these abnormal chemico-physical changes and restoring the protein in the blood, wherein the host's main resistance lies, to its normal chemico-physical state.

When I found that an attempt to render the intestinal toxaemia inactive produces better results in relieving patients of their cutaneous eruptions than relying solely on the local use of ointments, etc., that it enhances the action of the anti-syphilitic remedies and causes any additional manifestations to disappear, my attention came to be centred on this cause of the manifestations of disease and on the

abnormal chemico-physical changes which the protein needs to be made to undergo in order to produce them. The study of these two specialized subjects not only made me give up specializing to practise general medicine; it also brought within my purview veterinary science, agriculture, and the science of the soil. This bringing of the whole of the oecological branch of science within my sphere of investigation showed me that disease in man is traceable to the life in the soil, that disease is a departure from health, and that just as there is only one health, so can there be only one disease. This disease is the same in plants and animals as it is in man. And I learnt that the manifestations produced are determined by the abnormal chemico-physical changes which the invaders bring about in the protein in the sap of plants and the blood of animals and man.

The connection between life in the soil and disease in man was established by the finding that, in addition to the cocco-bacillus and its developmental forms being the micro-organisms in the soil which help to prepare the food for the plants in a form in which they can readily assimilate it, they are, also the micro-organisms which reside in the large intestine and play a role in the production of intestinal toxaemia. In this way they are responsible for what I call 'infections from within'. Soil devoid of these micro-organisms is one of the reasons why food grown in it is of inferior quality. And the ingestion of this inferior-quality food, coupled with the inadequate elimination of its waste products, for which it is responsible, constitute between them two of the other factors which play a role in the production of intestinal toxaemia.

My introduction to the protein in the blood—the pivot round which most of my work has revolved—was provided by my employing the dark-ground picture to illumine the phases of the *Leucocytozoon syphilidis*, and the changes which the colloid protein particles in the serum undergo in the Wassermann reaction and under the influence of arseno-benzene. This led me to compare syphilitic sera with sera obtained from patients who were suffering from other manifestations of disease and were being treated with other remedies, these sera with the plasma, and with the plasma whilst it was being made to coagulate. Finding it to be quite impossible with only the dark-ground picture to differentiate between a syphilitic and a non-syphilitic serum, and between the actions the different remedies have upon the manifestations for which they are prescribed, other than those of amelioration and aggravation, additional tests were applied. An attempt was made to place therapy, especially chemo-therapy,

on a rational basis. And the comparison made between the fluid parts of the blood, in the forms of serum and plasma, throw a completely new light upon the phenomenon of coagulation.

The additional tests included the sedimentation rate of the red blood corpuscles, the refractive index of the serum, the percentage of the blood-calcium, blood-sugar, blood-urea and blood-protein, the viscosity of the serum, and the viscosity-refractive index (V.R.I.) and the viscosity-percentage of the blood-protein index (V.P.I.). Although blood pictures began to be made in 1921 of every patient seen, irrespective of the manifestation of disease presented, and have since continued to be made, they throw no more than a general light upon the patient's condition; or, to be more exact, the condition in which her or his main defence mechanism happens to stand. No blood picture is distinctive of a particular manifestation. What the blood pictures do show, which was never expected, is that they are influenced by a factor which affects healthy and diseased individuals alike and varies in its influence from day to day and even at different times of the day. An inquiry into the nature of this factor led to the conclusion that it is composed of high-energy rays which I called 'climate'. Coupling the action of these rays with the blood pictures showed quite clearly that 'climate' is the cause of the acute stage of disease, which is thus shown to be seasonal. That the main manifestation produced in this stage is mosaic in plants, distemper in animals, and influenza in man. And that this manifestation is divisible into types and the latter into forms, which vary according to the depths in the protein in the sap of plants, and in the blood of animals and man, to which the high-energy rays penetrate, and the degree of the particular abnormal chemico-physical change which the host's main resistance is consequently made to undergo.

This delimitation of the acute stage of disease showed not only that intestinal toxaemia is the main cause of the sub-acute stage, but also that the chronic stage is the natural sequel to both the earlier stages. But it was not until all the abnormal chemico-physical changes which the invaders are capable of making the protein in the blood undergo as a cause of disease had been fully worked out, that it became possible to define the changes which characterize the stages and to show that no sharp lines of demarcation can be drawn between them.

Invaders were found to be divisible into physical, chemical and microbial. As physical, chemical and microbial agents are employed in the treatment of the different manifestations of disease, no great stretch of imagination was required to draw the conclusion that

therapy must be reckoned as an invader. The fact that treatment falls into the class of invaders is not only confirmed by its being able to have a harmful as well as a beneficial effect, but it showed also, once and for all time, that both the invaders and treatment act directly upon the protein in the blood. When I found that the arsenic in arseno-benzene does not act in syphilis by killing the *Spirochaeta pallida*: first, because its action is a direct one on the host's main resistance; and, secondly, because the *Spirochaeta pallida* is not the phase of the *Protozoon* which causes the infection, I sought to discover the rationale of its presence in the first of the chemo-therapeutic substances to be introduced. My investigations led me to find out that the arsenic in arseno-benzene acts as a metal, as a conductor, and as a contractor of the protein in the blood which has been made to over-expand. This discovery led to my introducing compounds containing less toxic metals than arsenic as active atoms for use in coccogenic infections. And to my predicting, as far back as 1913, that, once suitable vehicles were found, the hydrogen atom liberated from an active carboxyl group would have a similar therapeutic action in syphilis to the one displayed by arsenic in the arseno-benzene compounds. Three of the preparations introduced were manganese butyrate, sup 36 and sup 368B. In the first preparation, manganese is the active metallic atom; in the second, the hydrogen atom in the phenolic hydroxyl groups; and in the third, the hydrogen atom in the carboxyl groups. Although both these symmetrical urea compounds still continue to have their uses in the treatment of certain manifestations of disease, sup 36 became replaced, first by the sulphanilamide compounds and, later by the so-called 'antibiotics'. The prediction was fulfilled when it was found that penicillin acts similarly to arseno-benzene in the treatment of syphilis. The place of the arsenic in arseno-benzene is taken by the hydrogen atom, which is liberated from the carboxyl group in penicillin.

The sulphur atom in penicillin has the same action as the one in the compounds which I introduced several years ago for treatment in the late stage of syphilis, in cases of metallic poisoning and in cases of rheumatism. The action is the opposite to that of metals. Non-metals act as condensers and they expand protein which has been over-contracted. The carboxyl group, and the hydrogen atom which is liberated from it in sup 368B, contract over-expanded protein in those cases where the over-expansion has been automatically followed by the degree of over-contraction that results in a clot forming in a vein, in a branch of the pulmonary artery or even in the main artery itself.

My investigations into the nature of clotting show it to be a very much simpler phenomenon than is generally supposed. Clotting is a phenomenon displayed by the protein in the blood. When blood is withdrawn, from the body, the protein first over-expands and later over-contracts, and it is in the process of over-contracting that the protein clots, coagulates, or forms a gel. The protein is prevented from clotting by the addition of an anti-coagulant, which so over-expands the protein as to make the over-contraction that automatically follows result in the formation of colloid particles, which fail to undergo the change of dispersion, resulting in the formation of a clot, until they are treated with a kation. The addition of a kation, such as calcium, over-expands these over-contracted colloid protein particles. The over-contraction that automatically follows the over-expansion results first in the formation of a fibrin network, and later of colloid protein particles. The fibrin network encloses the colloid protein particles, contracts around them and squeezes the particles into the surrounding fluid. When the protein is made to over-expand in the body, as it is made to do by 'climate' in the acute, or seasonal, stage of disease, the over-contraction that automatically follows results in the formation of colloid protein particles resembling those which are made to form in the plasma in a test-tube. To these over-contracted colloid protein particles which form *in vivo*, the term 'viruses' has been applied. But as these bodies are formed only after 'climate' has over-expanded the protein, they can never be held to cause such manifestations as mosaic, distemper, influenza, etc. When the protein is over-contracted to begin with, and this abnormal chemico-physical change is followed by the one of over-expansion, the percentage of calcium in the blood may be raised. Thus in the changes of disintegration and dispersion which a certain part of the protein is made to undergo in both health and disease, a cycle is described.

Coagulation of the protein is not the only phenomenon to be displayed in the description of this cycle. Still more important is the morbid condition of inflammation that is produced when the cycle is described in disease. The morbid condition of inflammation is one of the two into which disease is divisible, the other one being cancer. The morbid condition of inflammation is characterized by the hypertrophic and hypotrophic changes caused in the cells of the attacked organ as the over-expansion and the over-contraction which the protein is made to undergo, are reflected upon them. The protein in the blood is the matrix of the organs. The organ attacked in disease

is the one originating from the part of the protein which is made to over-contract. As this part is determined by the extent to which the oldest part of the protein is made by the invader to over-expand, and as the change from over-expansion to over-contraction occurs at the junction between what I call the 'storing' and 'radiating' portions of the protein, or where the first bridge is depicted in my diagrammatic representation of the protein (*vide* Fig. 1, p. 282), it is not difficult to see how I came to make the mistake of regarding this region as the most important of the eleven regions into which the protein is divisible.

I saw my mistake after I had completed my investigations into the functions of the pineal gland. These showed me that the most important region in the protein is the fourth region of the attracting portion, or the third bridge, which forms the junction between the attracting and storing portions. The greater importance of this region lies in its being the region governing the over-expansion and over-contraction which the storing portion undergoes in disease. This influence of the region is enhanced by the anterior lobe of the pituitary gland and the pineal gland, which originated from its expander and contractor halves. These two ductless glands are the vertebrate representatives of the oldest parts of the invertebrate sense-organ mechanism. And the region is the one in which is described the cycle that results in the morbid condition of inflammation becoming replaced by the one of cancer. The morbid condition of cancer is characterized by two processes: the reflection of the over-expansion is to cause the cells of the organ attacked to become neoplastic and that of the contraction is to cause the nucleolus of the cells to multiply and to spread all over the body in the form of secondary growths.

Once I had come to the conclusion that the protein in the blood is a condensation product of 'activity', out of which I believe the whole of the universe is being fashioned, and that the protein expands and contracts, or pulsates, as 'activity' describes its cycles in it, similar to those which it describes in all the other products of its condensation, I had little difficulty in reaching the further conclusion, that the function of the ductless glands is to assist 'activity' to describe its cycles in the protein. I was enabled to reach this further conclusion by tracing the development of the ductless glands from the specialized visual sense-organs, the other specialized sense-organs and the generalized sense-organs, which control the pulsation of the protein in the blood of the invertebrates.

These conclusions have not easily been reached. In the process

many mistakes have been made; earlier conclusions have had to be amended, and those reached to date will doubtless have to be changed as more experience is gained. It is in this attempt to find the answers in the laboratory to the questions which are asked in the consulting-room that knowledge comes to be revealed, as it can never be in the attempts that are made to reach goals chosen in advance. The pursuit of the former course brings out one's better qualities, and one finds happiness in the fact that no conclusions reached can ever be the final ones, as the absolute truth is, fortunately for us all, quite unobtainable. The pursuit of the latter course brings out one's worst qualities and is responsible for the authoritarianism which hampers progress and is the curse of the modern world.

The curse is infinitely more serious than is generally appreciated, as authoritarianism has already begun to undermine national security. All big nations have been built upon a basis of independence, and they owe their greatness to the 'heretics', 'dissenters', or 'non-conformists', whichever name it is decided to apply to the unorthodox. Authoritarianism in this country, and even more so in the United States, has already succeeded in making a mockery of democracy by regarding dissent as an expression of disloyalty, criticism as an unfriendly act, and difference of opinion as a sign of disaffection. It is no wonder that the people are bewildered, perplexed and unhappy. The vicious circle is completed by the fear that is engendered in the breasts of the orthodox, a fear which can apparently be assuaged by the heaping of prizes, medals and honours upon them. Before it is too late this vicious circle must be broken. A beginning might profitably be made by slaying the dragon of modern research. The demise of this modern fetish would have the following results. In the first place the research workers would be compelled to become practitioners. In the second place the Institutes, which are financed with the public's money and in which the research workers have hitherto found a refuge, would be available for all the practitioners who wish to combine bedside and laboratory work.

In the third place, the Government might see the advantage to be obtained from amalgamating the Ministry of Health and the Research Councils, and staffing the single body with women and men who have shown evidence of being able to combine practical and research work.

In the fourth place, the learned societies, which serve at present as the meeting-places for authoritarian cliques, might consider amalgamating and opening their doors to all who desire to listen to their debates.

And, lastly, the Press would ultimately become qualified to form an opinion of the validity of unorthodox work.

As only the fringe of the work upon which I have been engaged for the past forty-eight years has been touched on in this Introduction, I propose to give, first, a summary of my present views on the Nature of Disease. Secondly, there follows a criticism of the Reports of the Chief Medical Officer on the State of the Public Health for the Year Ended 31st December, 1949, and of the Committee of Privy Council for Medical Research for the Years 1948–50. Thirdly, is to be found a report on Influenza in the Years 1950–51, 1951–52 and 1952–53. Fourthly, a section is devoted to the subject of Rheumatism. And, lastly, space is given to a discussion on the Ductless Glands in Health and Disease.

In concluding this Introduction I would like to express my most grateful thanks to Mr. Charles Davy for the very great help he has given me in the preparation of this book. I would also like to thank all the past and present members of the Board of Management and the Staff of the Nature of Disease Institute, without whose help and co-operation my work could never have been undertaken.

CONTENTS

THE NATURE OF DISEASE

Synopsis

DISEASE is a departure from health. Just as there is only one health, so is there only one disease. A respect in which disease differs from health is in its divisibility. Disease is divisible into manifestations, of which there are several; into stages of which there are three: the acute, the sub-acute and the chronic; and into morbid conditions, of which there are two: inflammation and cancer.

Health

Health is maintained so long as 'activity' is enabled to describe normally its pulsatory and respirato-alimentary cycles in the protein in the sap of plants and in the blood of animals and man.

'Activity' is the name I give to the primordial substance out of which the universe is being fashioned. 'Activity' is enabled to describe these cycles by 'climate' penetrating the protein and releasing 'activity' from where it is stored. 'Climate' is the name I give to the 'activity' which manifests itself in the form chiefly of varying high-energy rays.

In the course of the pulsatory cycles, the protein alternately and rhythmically expands and contracts, during which it radiates, attracts and stores 'activity'. This radiation, attraction and storing by the protein permits of its division into three portions, each of which is named after the function of 'activity' that it exhibits. The three portions are named the 'radiating', 'attracting' and 'storing' portions, and as such they are depicted in Fig. 1 (*vide* p. 282).

Owing to the vegetable structures having originated from the protein in the sap of plants, and the tissues, blood cells and organs from the protein in the blood of animals, the respirato-alimentary cycles developed from the pulsatory cycles. As 'activity' describes its pulsatory cycles in the protein in the sap and blood, the protein attracts 'activity' from the food, stores it in itself and radiates the 'activity' to the structures, cells, tissues and organs in the exact form that each one requires in order to be able to perform its special duties.

As the cells, tissues and organs originated from the protein in the blood at different evolutionary levels, the portions underwent division into regions. The radiating portion underwent division into four regions, the attracting portion into four regions, and the storing portion into three regions. The respiratory system and the parathyroid glands originated from the first region of the radiating portion. The portal system and the thymus gland, enclosing the islands of Langerhans, originated from the second and third regions, and the thyroid gland from the fourth region. The skin, eyes and the two nervous systems, from the sympathetic half of the former of which the chromaffin system developed, originated from the first three regions of the attracting portion. From the fourth region of this portion originated the pineal gland and the anterior lobe of the pituitary gland. The tissues and female gonads originated from the first region of the storing portion. The vascular system and the male gonads originated from the second region, and the uro-genital system and the cortex of the suprarenal glands originated from the third region. The red and the white blood corpuscles originated from the junction between the storing and radiating portions.

The origin of a ductless gland from every region is to be explained by all of them, with the exception of the female and the male gonads and the cortex of the suprarenal glands, being the representatives in the vertebrates of the sense-organ mechanism in the invertebrates. As the sense-organ mechanism originated from the cytoplasm of the unicellular animals and the protein in the blood of the multicellular invertebrates, in order to render purposeful (food-finding) the description of the pulsatory cycles in the cytoplasm and the protein, an explanation is afforded for the important role which the 'integrated endocrine glandular system' as I call it, plays in the vertebrates. The integrated endocrine glandular system includes all the ductless glands with the exception of the female and the male gonads and the cortex of the suprarenal glands, which do not belong to the same category.

The female and male gonads are concerned with the description of the reproductive cycle which, although influenced by that of the pulsatory and the respirato-alimentary cycles, is to some extent independent. The cortex of the suprarenal glands is concerned with the excretion of the urine and the products of reproduction. Excretion is a one-way traffic and consequently requires no description of a cycle for its execution.

Disease

Disease arises when an invader releases an excessive amount of 'activity' from its storage depot in the protein. The storage depot in the protein in the blood of animals is situated in the part of the fourth region of the attracting portion, from which the chromophobic part of the anterior lobe of the pituitary gland originated. This part also marks the place to where 'activity' returns on completing its cycles.

When too much 'activity' is released, the pulsatory and respirato-alimentary cycles come to be described abnormally. This is shown by the protein first over-expanding and later over-contracting. In the process of over-expanding, 'activity' is liberated, together with various constituents of the protein. In the event of the liberated 'activity' ionizing, fever is produced. In the process of over-contracting still more 'activity' is lost to the protein through excessive radiation. Over-contraction also results in the clotting time of the protein being shortened; in the separation of over-contracted parts from the junction between the storing and the radiating portions, to produce what are called 'viruses'; and in 'activity' being obliged to take one of the two courses to the terminus, the reaching of which is followed by death.

Viruses are formed only in the acute stage of disease, and death is by no means the inevitable result of the departure from health, or life. Death is prevented from being an inevitable result of disease by expansion being automatically succeeded by contraction, and by the first region of the radiating portion and the fourth region of the attracting portion over-contracting to save 'activity' from being obliged to take one of the two courses to the terminus. The contraction that automatically follows expansion is seldom pronounced enough, when the protein has been over-expanded, to prevent disease ending in death. It only becomes pronounced enough when the contraction is re-inforced by the over-contraction which, first, the first region of the radiating portion undergoes, and later, the fourth region of the attracting portion.

This re-inforcement made its first appearance in the segmented worms. The factor responsible for the change making its appearance in these animals was the replacement of the specialized visual sense-organs by the lateral eyes.

Prior to the birth of the segmented worms, the specialized visual sense-organs controlled the action of the other specialized and the

generalized sense-organs. The action was solely one of expansion. After the birth of the segmented worms the lateral eyes took over the control of the other specialized and the generalized sense-organs. The specialized visual sense-organs became the median eyes, and acquired a contractor action, which became partly shared by some of the other specialized and the generalized sense-organs. In short, the sense-organ mechanism came to act as a contractor in addition to acting solely as an expander, as it had previously been accustomed to do. The primary nervous system followed suit, and in so doing became divided into expander-acting and contractor-acting parts.

The additional power to contract which the protein in the blood acquired as a consequence of the change, resulted in the development of the protective cycle from the respirato-alimentary cycle.

In the vertebrates the median eyes developed into the pineal gland; the other specialized sense-organs into the anterior lobe of the pituitary gland; the parathyroid glands and the thyroid gland and the generalized sense-organs into the thymus gland and the islands of Langerhans.

The pineal gland has wholly a contractor action. The anterior lobe of the pituitary gland acts as an expander, but partly relatively as a contractor. The failure of the other specialized sense-organs, from which the anterior lobe of the pituitary gland developed, to come wholly under the influence of the lateral eyes, is shown by the division of the gland into three parts. The basophilic part is the relative expander-acting part, the acidophilic part the relative contractor-acting part, and the chromophobic part the storer-acting part. The parathyroid glands, owing to their having evolved from the other specialized sense-organs which retained their allegiance to the specialized visual sense-organs, have, like the pineal gland, a contractor action. The thyroid gland, owing to its having evolved from the other specialized sense-organs which came wholly under the influence of the lateral eyes, has an expander action, like the anterior lobe of the pituitary gland. The thymus gland and the islands of Langerhans, owing to their having evolved from the generalized sense-organs, which shared their allegiance between the lateral eyes and the specialized visual sense-organs (having given slightly the greater share to the former), act both as contractors and as expanders, and slightly more so as contractors than as expanders. The primary nervous system developed into the autonomic nervous system, the expander-acting part into the sympathetic nervous system, and the contractor-acting part into the parasympathetic nervous system.