Coniosis.

(Abstract)

By Robert Hessler.

This paper relates to an experiment on the part of Nature, one that is going on all about us on a large scale, namely adapting man to live in cities overhung with smog clouds, in other words, changing man from an open air animal to an indoor air animal.

Like all of Nature's adaptative processes, this one is attended with great loss of life. The outcome is still a matter of doubt. It seems that besides destroying individuals there is also a tendency to destroy the species. To what extent man can counteract this weeding-out process is an interesting as well as vital question. Besides great loss of life there is much misery and ill health, all of which may be regarded as a reaction to an abnormal environment.

In the evolution of living matter we find organisms adapted to all sorts of surroundings: lichens in the cold arctics and algæ in the almost boiling hot water of geysers; animals in water and on land, in deep caves and high in the air.

The naturalist and the evolutionist see a life and death struggle everywhere, plants fighting for possession of the soil, animals destroying life and seeking to avoid destruction. Nothing is at peace, war everywhere, a struggle for existence with a survival of the fittest. Nature is constantly at war with man, and civilized man himself is at war with Nature trying to counteract her.

Man as a species of animal is still undergoing the process of adaptation, the law of the survival of the fittest is still in active operation. Man has not even outgrown destroying his own kind; the annual expenditure for war or being prepared for war is a burden that threatens to ruin many a nation.

Man as a species has adapted himself to a variety of surroundings from pole to pole. In some regions there is perpetual winter, in other places there is perpetual summer. In the temperate zone there is an alternation of half a year winter and half a year summer. Man indigenous to the temperate zone is adapted to these changes in temperature. Indi-

viduals from extremes, from the frigid and torrid zones, are not adapted to changes. If the Eskimo and the South Sea Islander exchanged places they would quickly perish.

In his evolution man has passed through different stages of civilization, or as some one has said domestication. At first he was a hunter and fisher, living an outdoor life like the animals about him. This was followed by the pastoral stage. Then came the agricultural in which for the first time he had a fixed home, and that meant to keep alive his old and decrepit and sick; many house diseases now found favorable opportunity for propagating themselves. In the handicraft stage where men were confined indoors the conditions for the propagation of house diseases became still more favorable. During the present industrial stage man has actively counteracted the ravages of many specific diseases, has practically banished some, but many still flourish unchecked. Common ill health that can not be dignified by the name of disease is perhaps more prevalent today than ever. Many people are not adapted to domestication, to a life under indoor conditions, in short, to an artificial climate.

In many regions of the globe man still leads the simple outdoor life (in the interior of Africa, Australia, South America), in others men are massed in cities. City life means a many-sided contact with all sorts of causes of ill health and disease and the weeding-out process. The process of adaptation is attended with great loss of life, as just mentioned. Here again we see a survival of the fittest, those best able to live under unsanitary environment. But fittest does not mean best—the inhabitants of overcrowded filthy Chinese and East Indian cities do not head the list of best men, most highly civilized.

Dismissing far away people and confining ourselves to man at home, we again see how the process of adaptation has been at work in producing the fittest, but not necessarily the best.

We trace our ancestry to Europe. Parentage goes back either to country or city ancestry. The ancestors of some of us have always led a quiet isolated rural life, others were more or less in contact with city life. A few have ancestors who for generations lived under crowded city conditions. City life means a many-sided exposure to all sorts of weeding-out factors.

The man among us who has perhaps undergone the weeding-out process attending city life most thoroughly is the Jew who traces his an-

cestry to the ghettoes of old fortified European cities; his susceptible ancestors have been killed off to such an extent that he is largely immune to unsanitary conditions found in our cities. But he can not thrive under extreme conditions, such as are found in Asiatic cities, nor does he try to. Being ambitious he gets out of our own slums as quickly as possible.

On the other hand are the descendants of Southern Mountaineers, the latter a class of people who for several generations have lived in isolation, under so-called healthful surroundings, with an almost complete abatement of the weeding-out process found in cities. When they go to crowded, smoky and dusty cities they quickly fail. There may be complete failure, that is death, or failure of health with much ill health, the ill health attendant upon the process of adaptation. One can not properly speak of this as disease but as a reaction to an abnormal, an unsanitary environment.

Country-bred man goes to the city with a "stock of health." This in time fails, quickly in some, slowly in others; it may suffice for an individual but not for descendants and then we hear of race suicide.

Children born of city parents may perish at once or they may live for weeks, months or years and then die, perhaps after having had much ill health which finally terminates in disease. Certain diseases must be regarded as city and house diseases par excellence.

Just where health shades off into ill health, into minor maladies, and then into disease and death, is always an interesting study to the student of environmental influences, not to speak of the student of pathology.

Ill health touches many of us or our relatives or friends. Well-defined disease is comparatively rare, it may not appear until near the end of life. We should sharply discriminate between ill health and disease.

Some diseases have a rapid onset and may be fatal in a few hours, but as a rule the onset is slow and announced by preliminary warnings. Change of environment, making the conditions favorable for the body, may mean a continued existence.

Some diseases must be considered incident to city life and indoor life, notably tuberculosis and pneumonia—diseases with a frightful mortality. Then there is a host of minor maladies which must be looked upon as "diseases of civilization"—we need only think of catarrh, dyspepsia and nervous prostration.

We have not yet reached a stage where we judge the salubrity of a community by the amount of ill health. Our statistics relate to deaths —many individuals when fatally stricken leave the cities. The large industrial city overhung by smoke clouds has no use for the man over forty or forty-five. Men are soon worn out.

Besides people born in this country, natives as we say, there are those who come in directly from old European homes, immigrants of all kinds. How do they fare in our country? Here again we must consider the former life conditions and ancestral history and to what extent the weeding-out process has been operative. The conditions for existence in the new home may be better or worse.

There is an old saying, The good die young. I do not know where that saying originated but I feel sure it is one based on city life. Such a saying is diametrically opposed to the belief in the survival of the fittest. The man best adapted to live in slums is not the best type of man—if this were so the inhabitants of crowded Asiatic cities would head the list.

There is another saying, Mens sana in corpore sano, yet when we study biography we find that many of the world's greatest minds had much ill health, some constantly complained. What makes a healthy body? Must or should we contrast healthy or health with disease? or would it be better to contrast it with ill health? The physician constantly meets people who have ill health and yet no disease. In general it may be said that health results from country life, ill health from city life.

When we study the lives of city people who complain much of ill health we may find that their bodies are "healthy" enough but that there is a reaction to an abnormal environment, particularly abnormal air conditions; there are all sorts of symptoms of ill health. If we carefully study life histories of individuals who have had much ill health we may find that although they had ill health in the city they lived comfortably under simple country life conditions. We may come to the conclusion that symptoms of ill health must be regarded as warnings from nature to be heeded. Formerly it was assumed that "neuralgia is a cry for pure blood;" today we may safely assume that most symptoms of ill health in city people are cries for pure air.

What distinguishes city from country life? One could quickly make a long list of antitheses, beginning with crowding in the city and living

in isolation in the country. Many conditions are so extreme that the reader has no difficulty in determining where a mention applies: pure food, contaminated food; good water, polluted water; pure air, impure air; smog clouds overhead, blue sky overhead.

Crowding, food, water have all for a long time received attention and great efforts have been made to improve conditions. But not until recently have air conditions been given attention. Black smoke clouds receive frequent mention in the public press. The dust problem is likewise receiving more and more attention—if the people knew to what extent it is a factor in producing ill health and disease and death they would soon make a determined effort to alter existing conditions.

What are the effects on a pure air man when he goes into the large and dirty city overhung with smog clouds? Dust makes him feel dirty, his hands and clothing are soiled; he "blows black" into his handkerchief and spits black; there is more or less free production of mucus, followed perhaps by pus formation, and he will speak of having catarrh; in attempting to hawk up morning phlegm he may become nauseated and even vomit; dust particles reach his lungs and become imbedded, the lung becomes black (in old city residents it is coal black, pneumokoniosis); he experiences all sorts of disagreeable sensations, symptoms of ill health so-called, symptoms shade off into affections, minor maladies and disease; infective particles are locked up in the lymphatics, forming "kernels" in the neck and tumors along the windpipe and in the lungs and these bursting produce disease and death. The two great dust diseases are tuberculosis and pneumonia, they decimate mankind by thousands and millions.

Medical men have names for the effects produced by the inhalation of different forms of dust: Anthracosis for the effects produced especially in coal miners; Byssinosis due to inhaling cotton dust, as in cotton factories: Chalicosis, Silicosis and Siderosis are names applied to affections in potters, stone masons and iron workers who inhale gritty matter. The term Pollenosis is expressive and should come into general use; the name indicates a state or condition produced by inhaling pollen, that is in those susceptible.

Kinds of Dust[1].—There are all kinds of dust, all of varying importance in the welfare of man. To the physicist dust is of great importance in the matter of light and shade and precipitation; to the tidy house-

[1] For a synoptical table of Kinds of Dust an relationship to stages of civilization, see my Presidential Address, Indiana Academy of Science, for 1906, p. 23.

keeper dust is something to be fought constantly; the merchant looks upon it as something that spoils his goods; the physician looks upon it in the light of a producer of ill health and disease. In industrial cities factory dusts of many kinds occur and produce so-called industrial diseases.

A very pernicious kind of dust to which people living massed together are exposed is dust containing dried spittle and full of all sorts of infective matter, infective dust. This is the kind of dust of most importance to the student of Coniosis.

The modern dust problem can be considered from many viewpoints, physical, mechanical, economic, sociologic, esthetic, medical, pathologic, biologic.

Biology and pathology are closely related, often it is difficult to determine what is normal and what is abnormal, or what must be considered normal in the light of an abnormal environment. Dusty air produces reactions, states or conditions, in living organisms. Is the change adaptative and biological? Is it degenerative and pathological? We expect a tree to grow in the woods but not in the crowded city; we expect children to grow in the country—but many of us doubt their thriving in crowded cities. We ask what is abnormal, the child that does not thrive or the environment.

Disease, Ill Health, Symptoms, Reactions to Environment.—Disease is a term loosely applied to all sorts of conditions, to all sorts of reactions of the human body (not to speak of animals and plants), on the one hand to the morbid processes induced by the great epidemic diseases that kill by the thousands, and, on the other, to mere feelings of discomfort as those attendant on overeating, over-exercising, worry, etc., etc. Symptoms and disease and states of ill health are constantly confused, and indeed are often very confusing.

Shall the reaction due to inhaling dust be regarded as a disease or as a condition of ill health, or as a reaction to an abnormal or unsanitary environment? Shall we regard the effects produced on inhaling dusty air as a disease, or as a reaction that can be studied in the light of biology? (In answer I may say that several years ago I looked upon the reaction as a disease and published a paper based on data then at hand.)

In this paper I shall consider the subject in the light of a reaction to an abnormal environment, as a problem in biology. I shall consider symptoms as warnings from nature. If the warnings are heeded man lives on and on; if he does not heed them he perishes. In proportion as man

guards or protects himself he survives. One need scarcely consider the few individuals, shall we say the survivals of the fittest, able to live under filth and filthy air conditions. Fittest does not necessarily mean the best —the slums of cities do not represent civilization, neither do backward cities represent the civilization of today. We have not yet reached a stage where we look far ahead into the future. We still act upon the principle of letting the future take care of itself. After us the flood.

Coniosis (Konis, dust; osis, a state or condition) may be defined as a peculiar state or condition due to inhalation of dust (dust with more or less infection derived from dried spittle); it is a reaction of the body. The reaction varies from a mere feeling of discomfort up to decided painful sensations, perhaps with a feeling of ill health or threatened sickness. Metabolism is more or less disturbed, depending on the amount of reaction; there is deviation in temperature; the sensory organs and the sensorium are more or less affected, likewise the circulatory and excretory systems, with variations in the secretion of gastric juices. Pain may be localized in old injuries or weak parts of the body. The severity of the reaction depends on the amount of exposure. The reaction may last a few hours or indefinitely under continued exposure.[1]

In attempting to define the term Coniosis one feels himself in the position of the physician in court when asked to define insanity: he may very well know what it means and to whom to apply the term when making an insanity inquest—but to make a definition that will be satisfactory to a quibbling lawyer is a difficult matter. The definition of Coniosis (which the general practitioner of medicine may regard as ill health) may not be satisfactory to the student of specific diseases, there will be quibbling.

If a man wants to know why it is difficult to make a good definition of insanity he should spend a few months among the insane. If he wants to know why it is difficult to define Coniosis or dust infection he should carefully observe a number of dust victims. (A man may even study himself, how he reacts under good and bad air conditions.)

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[1] In a paper on Atypical Cases and Dust Infection (American Medicine, 1 Oct., 1904) I used the following definition:

"It is characterized clinically by an irritation of mucous membranes; vague wandering pains throughout the body, mostly referable to the muscles or ligaments; lassitude, headache, feverishness and anorexia, up to vomiting, marked nervous disturbance, and severe localized pain. The manifestations may vary considerably in different individuals, and the symptoms may be wholly subjective. It is often followed by other, specific, diseases."

At that time I had assumed that the term Coniosis was preoccupied.

Here is an illustration which I at times use in discussions with dust victims.

A man becomes the possessor of an automobile, he learns how to run it but knows little or nothing about its internal arrangements. On the road the machine begins to run badly, he knows there is something wrong but can not locate the trouble; he may or may not make an attempt to learn what is wrong; he may conclude to run the machine as long as possible and then turn it over to a master-mechanic to have the difficulty corrected. He may be sufficiently interested to learn about the "internal anatomy and physiology" of his machine and just what to do the next time there is trouble, indeed knowing the nature of the machine he may look it over at short intervals to avoid trouble on the road. Shall we say that dust in the carbureter is a frequent cause of trouble?

Any one who has ridden with an experienced and with an inexperienced automobilist will appreciate this illustration: He probably noticed the direct method of the one in looking for the source of difficulty on the merest indication of abnormal working of the machinery, and he can not avoid noting the utter helplessness of the inexperienced man when his machine balks; the latter usually does more harm than good in his bungling with wrench and hammer trying to make the machine go.

A dust victim may be regarded as a machine that becomes clogged with dust. Dust interferes in some way with the proper working of the machinery, in time the machine may refuse to run. Like the automobilist, he may in time learn much about the significance of symptoms, of warnings that something is wrong, and he avoids breakdowns, attacks of ill health and disease.

Dust Victims.—Individuals who react more or less markedly to dust may be regarded as dust victims. In studying a large number of such one can make a composite description of the effects of inhaling dust, of Coniosis as defined above—but in proportion as a brief composite description includes many individuals it must be more or less vague.

An individual as a rule reacts very much the same each time under similar exposure. Individual reactions however may differ greatly, so much so that one can speak of types.[1]

[1] In 1904 I described several types of dust victims, as far as I then understood the subject. Since then I have been gathering more data, more case reports, but I am not yet in a position to bring together all my data for a complete statement. This paper, like all others, must be regarded as provisional, subject to changes and corrections.

It needs scarcely be added that nature makes transitions and naturalists make divisions, and that divisions overlap. A reaction of the body may become so marked that we speak of the presence of disease. Moreover some organ or part of the body may be weakened and here the first evidences of abnormal functioning, or ill health or disease, may appear.

Types of Coniosis or Dust Infection.—Coniosis can be considered as an entity. It shades off on the one hand into health and on the other into disease. By studying a large number of "dust victims" one can distinguish certain more or less well-defined types or varieties, briefly characterized about as follows:

Respiratory Type: This type manifests itself mainly by symptoms or conditions that we commonly regard as colds and catarrh; in more advanced cases with more or less active inflammation by affections with all sorts of names, rhinitis, pharyngitis, laryngitis, tracheitis, bronchitis, pulmonitis. (Often there is much adventive tissue in the upper air passages —adenoids, hypertrophied tonsils, etc; removal of such tissues may greatly benefit.)

Peripheral Type: This is marked by the appearance of more or less ill defined pains and aches, at times by acute pains, especially at the site of an old injury. The pain is variously referred to as rheumatic or neuralgic. Pain may occur in any part of the body but may be localized in the arm or leg or toe or in the head or chest. (So-called living barometers are often dust victims who react acutely to dust influences.)

Alimentary Tract Type: Under such a head may be grouped individuals with more or less marked digestive tract disturbances, notably by conditions commonly regarded as dyspepsia and constipation. In some there is an excess, in others a deficiency of hydrochloric acid; mucus may be greatly in excess. (In studying the life histories of individuals one may find that what at first was an excess of free H Cl in time becomes a deficiency, there may even be a total absence. So-called laboratory examinations become highly important.) Where dust infection manifests itself as more or less constant constipation during the closed door season attention to diet, to exercise and the use of a proper laxative become imperative. (The best laxative and the best tonic or alterative is pure air—something many can not afford.)

Nervous Type: Here one can distinguish between nervous and mental symptoms. The importance of symptoms is largely dependent on the

life an individual leads. The brain worker may be disabled by symptoms that might not be at all noticed by a common manual laborer. A headache disables the one, a backache the other.

The nervous type is difficult to define briefly, but if we will keep in mind the average individual who is called "neurasthenic" or "hysteric" or as being "imaginary ill" we will have some idea of what is meant. It is sometimes said that "the complaints of the neurasthenic are innumerable," but they are enumerable, and they are preventable in perhaps nine-tenths of the cases that ordinarily come before the physician. (All some people need is good air—but what patients usually want is medicine that will enable them to continue life under the old environment.)

Psychic Type: Some individuals react mentally, especially to the air of crowds. Dull school children are often dust victims. Men are subject to moods and humors; they may be agreeable or disagreeable. Perhaps all have noticed that there are times when one can think clearly and persistently and there are times when thoughts will not come or when one can not reason clearly; this again may largely depend on air conditions. The reaction may even be so extreme that we speak of insanity.

Cardio-vascular Type: Here there is more or less marked change in heart action and blood pressure, especially an elevation or hypertension, this may manifest itself mentally, overlapping the above type.

Dust victims may be divided into two groups according to the blood pressure, whether low or high. The one tends to end in wasting diseases like tuberculosis and catarrhal pneumonia and the other by apoplexies, paralyses and Bright's disease. It is necessary to mention these things so that the dust victim will take heed in time. (An interesting question to the physician is, What preceded an apoplexy? To what extent, for instance, was something done out of the usual, as riding on an overcrowded train or street car, shopping in ill ventilated stores, in short, having been exposed to infected dust?)

Cutaneous type is manifested especially in so-called neuroses of the skin, conditions or symptoms at times difficult to explain.

Genital Type: Here come particularly women who have pelvic disturbances, both acute and chronic, which interferes more or less with the process of reproduction. This type should be considered in the matter of race suicide. "Flat life" is very destructive to human life, all sorts of factors must be considered—one rarely considered is the dust factor.

Coniosis should be looked upon as a reaction to an abnormal environment, rather than as a disease.[1] It manifests itself by a variety of symptoms all more or less modifiable by the use of drugs, mainly by masking them. Although incurable it is readily preventable.

Coniosis is most prevalent during the closed door season when clean or pure air is at a minimum. It may occur in epidemic form in winter, at times of a thaw when sidewalk filth is tracked indoors and pulverized under foot, as by shoppers. It may also occur in epidemic form at times of high winds, when street filth is blown about, as on the approach of spring, when nearly everybody complains more or less—and many think they need a "spring tonic."

Coniosis is prevalent among people in all walks of life. Among poor people to whom life means a constant struggle for existence there is an early and constant weeding out on account of the appearance of well-defined diseases that kill. Among the well-to-do many reach old age because they are careful but there is more or less constant complaint of ill health. Coniosis is not incompatible with long life, that is in those who are prudent. The attitude of the poor man, and of those who are heedless, is shown by the old observation of Plato:

"When a carpenter is ill . . . he expects to receive a draught from his doctor, that will expel the disease by vomiting or purging, or else to get rid of it by cauterizing, or a surgical operation; but if any one were to prescribe to him a long course of diet, and to order bandages for his head, with other treatment to correspond, he would soon tell such a medical adviser that he had no time to be ill, and that it was not worth his while to live in this way, devoting his mind to his malady, and neglecting his proper occupation: and then wishing the physician a good morning, he would enter upon his usual course of life, and either regain his health and live in the performance of his business; or, should his constitution prove unable to bear up, death puts an end to his troubles."

What the carpenter needs, what the workman needs, is a knowledge of the influence of environment, and a knowledge of the limitations of the physician in curing ill health and diseases. Much ill health is incurable

[1] The term disease is really an objectionable one because many people at once think of a "cure." The patent medicine man keeps alive the old belief that there is a cure for every disease. To simple people all things are simple. As a matter of fact the "diseases" of the patent medicine man are mostly symptoms. Many people still have an idea that a disease can be "knocked out" or "killed."

but preventable. Proper ventilation prevents much ill health—but if the individual asks for it he is apt to be discharged. We here see the value of Unions in making a combined demand.

Symptoms.—Symptoms are usually divided into subjective and objective, those that we experience ourselves and those that we observe in others. The latter are also called signs. Some signs are discoverable only by the use of instruments, or laboratory methods.

Ordinarily we do not speak of symptoms of health, but we do speak of symptoms of ill health, and of course of disease. Indeed, some diseases are said to be made up of symptom-complexes or syndromes and are diagnosed thereby.

Symptoms are evidences of abnormal functioning. Symptoms can be regarded as warnings that something is wrong. In this volume I am speaking of symptoms not as evidences of the presence of disease but as an evidence of a reaction due to inhaling dusty air.

The individual who does not react to his environment is exceptional. At the other extreme are the very susceptible, to these a study of mesology and ecology may be of advantage.

Symptoms in great variety occur in Coniosis. Many of the common ones accompany the general type, others are more or less limited to the special types. Pain, in its widest sense, is a very common symptom. Cough is common in the respiratory type; headache is common in the nervous type; albuminuria, arrythmia, edema, palpitation in the cardio-vascular, etc. I am here making only brief references. Symptoms enable us to classify or group.

Susceptibility.—This varies greatly and is determined by a large number of factors, such as the phylogenetic history; the ontogenetic history; the place of residence, whether city or country; the amount and intensity of the exposure; the air conditions before and after exposure; the state of nutrition, whether over- or underfed; the ability to take a day, a week or a month off when not feeling well; etc., etc. The very susceptible individual may really suffer less by living within limitations than the less susceptible who is heedless. It needs scarcely be added that an individual can largely guard himself against environmental influences but less against hereditary tendencies.

Some individuals who react acutely are constantly watching themselves, are "exceedingly careful," and yet if they do not know where the

danger lies are constantly suffering. A knowledge of Coniosis is of great value to them.

For a man who has long believed he had consumption or was constantly on the verge of it, or that he had cancer of the stomach, or Bright's disease, or heart disease, not to speak of other diseases and affections, to know that he is "only a dust victim," that his fears are perhaps wholly groundless, is certainly a great relief. But the prudent man will take care to avoid exposures, knowing that disease may follow an acute attack of dust infection, emphasized in the warnings of the patent medicine man, "Beware of a cold."

At the other extreme is the man in "robust health" who is constantly exposed but who, because he does not complain, is assumed not to react. Yet he may be reacting all the time, as by gradually developing a high blood pressure and then suddenly going to pieces prematurely.

Coniosis may be looked upon as a "Protean disease" with which the general practitioner of medicine is very largely concerned, not to speak of people who "doctor" themselves. Perhaps the great majority of the "diseases" for which the patent medicine men advertise their nostrums and cure-alls fall within the scope of Coniosis. If we understand that Coniosis is a reaction to an abnormal environment, we at once see the uselessness of attempting to cure by drugs. Drugs however may palliate—alcohol, opium, cocaine, acetanilid are largely interchangeable; all are habit producing drugs.

When marked symptoms, as of ill health, appear then Coniosis becomes a medical subject—and then the best advice to a dust victim is to seek the services of a competent physician, one who will properly investigate, if necessary by laboratory methods, and who will discuss findings freely. Usually good advice rather than medicine is needed in such cases, but we should not forget that drugs may palliate, may modify severe symptoms. (Here is a very practical point: Pay the physician for advice rather than for medicine—or in self-defense he will dispense medicine or write a prescription for a tonic in order to get his fee. The practice of medicine is after all a bread and butter profession. The physician who makes time-consuming examinations in competition with symptom-prescribers often has difficulty in maintaining himself.)

Results of Exposure.—What constitutes an exposure? This is a matter in which personal experience largely enters; each must learn for him-

self how much or how little he can bear. Exposure to extremely bad air conditions, as going to a political meeting with spitters all about or riding in a dirty car, may bring on a prompt reaction, or the reaction may appear under continued exposure to relatively good air.

Since infected dust is a variable quantity there is more or less danger of complications and Coniosis proper may ultimately develop into what the physician regards as disease and perhaps well-defined specific disease.

Coniosis vs. Disease.—It seems a trait of human nature that the moment a name is given to a thing or a phenomenon the mind is satisfied and makes no further inquiry, except the scientific mind. The physician constantly sees this in dealing with his patients. What is the matter? he will be asked by his patient, who often enough has his own diagnosis and merely comes for a "little medicine." If told he has a cold, or bronchitis or rheumatism, or stomach trouble, or heart or kidney trouble, etc., he usually asks no further, still more rarely about causes. If he does ask about the cause or causes and is told his trouble is due to "cold" he thinks he understands and rarely indeed asks further. And yet the physician has great difficulty in defining a "cold," just as he has difficulty in defining nearly all the names current among the people or used in patent medicine advertisements.

As long as we look upon every reaction of the body as a disease, or that a certain combination of symptoms constitutes a disease, the average individual will make no effort to find the reason why he is not feeling well, nor will he make any radical attempts to get well. There are not lacking those who deny there is such a thing as disease, that it is all imaginary; they must be taught that just as there is a reaction when the hand is put into hot water or when irritating smoke is inhaled, so there will be a reaction on inhaling dust. Perhaps we had best not speak of disease at all, only of a reaction, and that this reaction moreover depends on what may be called individual susceptibility, varying from slight to marked. When the subject is once understood each one can determine for himself to what extent he is susceptible; a good physician will help him, especially to rule out other reactions, so-called diseases.

Some individuals or patients must be kept under observation for some time before a physician will venture on a diagnosis, some constantly "fight for time." Diseases that can be readily and accurately diagnosed and about which the opinions of different men will not vary greatly are

comparatively few. States of ill health where no accurate diagnosis can be made are many. Some physicians hesitate to make a diagnosis when they know the patient has already had a variety of diagnoses and likely will receive more after leaving him. Some "cases" are as easy to "treat" as they are difficult to diagnose. Physicians have an old saying, Any one can prescribe, the difficulty consists in making a proper diagnosis.

It should be kept in mind that Medicine like everything else is an evolution and that it has not yet reached a stage where it can properly classify the things with which it deals—with reactions and states of the body variously termed disease, maladies, affections, symptoms. Much is still to be learned about the common ills of the common people.

Primitive Medicine included all the sciences, as knowledge developed sciences crystalized out and each pursued an independent course; some have now little connection with Medicine proper. We need only think of chemistry, as an outgrowth of alchemy, and the search for the elixir of life and the transmutation of metals, or of the herbalist changing into a botanist and more recently into a bacteriologist concerned with microscopic plants. In short, sciences formerly studied by medical men have now developed to such an extent that the practitioner of medicine can not acquire more than a smattering knowledge of them; and that means in proportion as men specialize they must limit their field of work. A specialist in one department of Medicine may scarcely know what is going on in other departments.

There are topics that are of interest to all, such as the life conditions under which we live and the search for the favorable ones and avoidance of the unfavorable. Favorable conditions tend to what we call health, unfavorable ones to ill health, disease and death. Extinction may come suddenly or slowly; it may not appear for several generations—in what is called race suicide.

Differential Diagnosis.—Just where reactions, or symptoms shade off into disease is often difficult to determine, in fact is impossible because there is no exact definition of the very term disease.[1] In order to diagnose Coniosis properly one must rule out other more or less related conditions, especially diseases, socalled. For the purposes of this paper it may

[1] Diseases themselves are variously classifiable. A common division is into parasitic (due to invasion of parasites of all kinds) and constitutional (due to defects in the body, congenital or acquired). Another general classification is structural and functional.

suffice to divide the latter into three groups: 1. Diseases proper, due to specific or definite pathogenic causes; they are as a rule self-limited and run a more or less well-defined course. 2. Diseases due to alteration in structure and usually incurable when once fully established; some are favorably influenced by surgical procedures. 3. Diseases due to alteration in function or temporarily altered functioning, more or less preventable or modifiable.

1. *Specific Diseases*, those due to definite causes, as pathogenic microorganisms. The reaction of the body in its efforts to rid itself of the enemy is manifested by signs and symptoms, and the syndrome or symptom-complex is designated as disease, in other words, diseases are made up of symptoms. In the absence of symptoms one would scarcely speak of the presence of disease (although a disease may exist and not manifest itself for a long time). Nosologists are attempting to classify diseases by their causes, but so far only a good beginning has been made; much work remains to be done.

To make full statements regarding the diseases of our State would require the possession of data difficult if not impossible to obtain. The proper method of studying the specific diseases of a country would be to consider them in the order of their appearance and how they dominated other diseases and prevalent ill health. Here I can only briefly refer to a few diseases.

Malaria. This disease or its cause came early. Formerly our State was very "unhealthy" on account of the presence of malaria. It dominated everything. With the clearing up of wet places where mosquitoes breed and by the free use of quinine malaria has practically disappeared.

Malarial fever is to be ruled out in dust infection. Many physicians still suspect a "malarial element" in many cases of common ill health, at times referred to as a "touch of malaria." True malaria yields readily to quinine in sufficient dosage, dust infection not.

Physicians are accustomed to speak of another form of malaria. Locally we have the name False Malaria. It is not dependent on the plasmodium malariæ nor is it transmitted by the bite of mosquitoes; it is transmitted through infected dust. It is, in short, dust infection or Coniosis.

Some writers believe that the civilization of ancient Greece and Rome passed away on account of the presence of malarial fever, in altering

man's environment to such an extent that he could no longer flourish. Malaria literally means bad air, but in the case of malarial fever we know that this is really not true. Regarding the air conditions of our cities we can properly speak of mal-aria. We can even speculate to what extent bad air is a factor in destroying our own civilization, shall we say by killing off the desirable and leaving the city to the undesirable?

Tuberculosis: This is the great indoor air disease which is actively weeding out those not adapted to city life or to life indoors under bad air. Individuals whose ancestors have long been exposed to the ravages of tuberculosis are largely immune, succumbing only when conditions are unusually bad or prolonged. It is well known that the descendants of European ghetto Jews are largely immune while Russian rural Jews are not. The descendants of southern mountaineers are very susceptible. Phthisophobiacs are often dust victims whose fears can be allayed.

Pneumonia is another great indoor disease, now ranking with tuberculosis. It is a disease of the wellfed rather than of the poor. Individuals subject to high blood pressure seem especially prone to pneumonia. An acute "cold" (dust infection) may terminate in pneumonia.

Influenza is a disease that appears periodically, after an interval of years, and attacks practically everybody. After a pandemic subsides there may be sporadic cases for a short time. Cases of "grip" after the subsidence of epidemic influenza are usually cases of dust infection. Influenza manifests itself by several quite well marked types, indeed, the similarity to dust infection is quite marked. The best treatment for Influenza, in reducing the number and severity of symptoms to a minimum and avoiding a fatal termination, is the pure air treatment.

This enumeration of specific diseases can not be continued but there should at least be a mention of Cancer.

Cancer: Although the active cause of cancer is still unknown it is regarded as a definite or specific disease, running a more or less well-defined course, usually fatal in a short time. Cancer in its various forms or kinds is to be ruled out, especially in dust victims of the alimentary tract type; to do that properly requires the use of laboratory facilities.

2. *Diseases Due to Alteration in Structure*, to enlargement or atrophy, to altered innervation or imperfect nutrition or circulation, to the presence of scar tissue, to adhesions, etc. This condition is often due to injury or to the presence of disease which produced alteration, with an

alteration in function. But the altered functioning of an organ may be perfectly natural for such an altered organ, it could not be otherwise. The presence of an acute disease may so modify "the normal action of an abnormal organ" that at first sight a case may seem very mystifying—hence the need of studying an individual not alone when complaining but when in apparent health. A good family physician in time learns much about his patient and knows just what to do in case of an acute disturbance.

Alterations in organs and tissues are very common in people much exposed to infective matter, especially in the air they inhale. There may be at first mere irritation, followed by active inflammation and then scar tissue. In proportion as there is scar tissue there is alteration of function, finally reaching a stage where well marked symptoms appear. Whether to speak of disease or reaction is often a matter of doubt; one may not be able to decide until the reaction has ceased or the pathological process has run its course. (One is reminded of "How to distinguish mushrooms from toadstools.")

If one were to enumerate systematically the diseases, maladies, or affections to be ruled out in dust victims, one would have to begin at the nose and mouth where the inhaled infection first shows its effects.

Infection reaching the sense organs may produce all sorts of disturbances, acute and chronic, as impairment of abolition of the sense of smell and taste, or impaired hearing and sight.

A host of affections or "diseases" of the respiratory system would have to be considered, such as rhinitis, laryngitis, tonsilitis, tracheitis, bronchitis, pulmonitis, etc.

Infection may travel down the esophagus with the production of conditions designated as pharyngitis, esophagitis, gastritis of many varieties, and intestinal disturbances in variety, one marked form being attended with the production of large quantities of mucus.

Here I can not consider the influence on other and distant organs, the kidneys for instance, or the nervous system.

3. *Diseases Due to Altered Functioning*, more or less transient, and more or less bound up with conditions described above. Here might be cited a number of conditions that can not properly be called diseases at all—such as the more or less transient effect of much or too little food; the use of too much or too little fluid; or foods that produce a reaction,

perhaps an intoxication; the excessive use of condiments; the influence of heat or cold, etc. To what extent to speak of diseases, of symptoms or of reactions is at times a difficult matter to determine, there are no hard and fast lines, no more than between species, subspecies and varieties. Opinions vary.

What is in dust that produces the condition described as Coniosis? This is really a question for the pathologist and bacteriologist, for men who study causes. For our present purposes all we need to know is that there is something to which the body reacts. In illustration might be mentioned malaria: all we need to know to protect ourselves from malaria is to keep from being bitten by the mosquito which transmits the disease, and indeed we need not fear its bite at all if there is no malaria about. We know what the active cause of malaria is but in the case of Yellow Fever transmitted by another species of mosquito we do not know, and yet keeping the mosquito under control and avoiding being bitten means to prevent the ravages of Yellow Fever.

In the case of Coniosis as defined above we need only consider kinds of dust, whether in part it came from man, particularly expectoration and whether sterilized by age or sunlight. The inhalation of country dust may be disagreeable but it is not the kind of dust that produces Coniosis. We at once see that infected dust is very common in backward cities, less in clean cities and wholly absent in the isolated country.

We see an analogy in pollenosis or hay-fever. This occurs where the pollen of certain plants abounds. The hay-fever victim no longer expects to be cured by the use of drugs; he knows that he will feel miserable as long as he is exposed to the particular pollen to which he reacts. To get relief, he "changes climate;" he goes where the air is free from this irritating dust—just as people who are educated regarding Coniosis will also make a change.

"Precolds" under exposure to "exciting causes" result in "colds." Colds are commonly although not necessarily always attacks of Dust Infection.

To what extent the body protects itself and to what extent man makes an effort to protect himself are very practical questions, but they can not be considered in this brief abstract. People are often "exceedingly careful" in their attempts to avoid ill health and sickness, but not

knowing where the real danger lies they are overcareful along some lines and not sufficiently so in others. Some must consider the dust factor in order to survive.

Dust victims and observant people generally often have a stock of unformulated knowledge (obtained through bitter experience) that is of more value to them than the advice and medicine of the young physician who in college is taught about diseases but little or nothing about the common ills of the common people. The physician like everybody else learns much in the school of practical experience, and he often learns from old chronics, if he gains their confidence. Related data may be formulated by comparing the experiences of many. Often all sorts of apparently isolated facts are explainable by a theory.

Individuals who are designated as "old chronics" often have "tried everything" and being still uncured have lost faith in drugs and in the science (or should I say art?) of Medicine. A physician may induce some to look upon their ill health in a new light. Some readily take up with the idea or theory of Coniosis—to them it may become a working theory, a guide that enables them to reduce symptoms to a minimum. Coniosis moreover is a subject that can be studied by any one, no medical education is necessary although desirable. It is moreover a study that should be taught in a practical manner in the schools, not as mere book learning.

Like all theories relating to complex biological problems the theory of Coniosis should not be applied too rigidly, for the case under consideration may be wholly exceptional. The practitioner of medicine must constantly bear in mind that he is dealing with fellow-creatures who have wants and needs; he must consider all sorts of causes and factors.

There are any number of problems regarding dust influences that still seek solution. The dust victim who will study himself and keep a record of himself and his varying surroundings can greatly assist his physician, and if he perchance has a physician who is not a student he may deem it advisable to make a change; he may even conclude to go to a community where people expect more from physicians than merely handing out medicine.

The question, What makes dust dangerous, what is the noxious matter? is a problem that is beyond the scope of the ordinary physician. It requires laboratory facilities and unbounded time. The need for a special institution for studying details is imperative.

What the Theory of Coniosis Explains.—In the light of present data the following statements seem justified:

Coniosis explains many cases of common ill health, cases that can not be definitely diagnosed as disease, cases about which differences of opinion among doctors are proverbial.

It explains the prevalence of our "Triad of National Diseases"—catarrh, dyspepsia and nervous prostration.

It explains why much of the "prevalent ill health" is incurable, but preventable.

It explains why there is a seemingly endless succession of nostrums advertised in the newspapers and medical journals; all may have some merit in palliating symptoms—but as to curing that is another question.

It explains the prevalence of patent medicine advertisements and their seasonal variation.

It explains why our nation is a land of fads in medicine and quack remedies (mainly because we tolerate the chewer and spitter).

It largely explains the discrepancy of opinion between city and country doctors regarding typical and atypical cases.

It explains the ordinary ills of the school child and the seasonal prevalence of some specific diseases.

It explains the "degeneration" of school children and the supposed influence of "overwork." (Usually there is an overworking of the defences of the body.)

It largely explains why poor people who must work under crowded conditions perish prematurely and why old chronics able to take care of themselves live on indefinitely.

It explains why many foreigners fail in our cities, some physically, others mentally. (Immigrants not adapted to city life should be encouraged to settle in the country and not in cities and certainly not in slums.)

It explains the prevalence of tuberculosis in low pressure individuals and of heart and kidney diseases in high pressure individuals.

Coniosis gives a clew to the chronic ill health of men and women whose biographies are full of references to ill health.

It puts a new interpretation on the old saying, Acquire an incurable disease and live long.

It teaches us to make sharp distinctions (or attempt to do so) between symptoms or ill health and real diseases.

It shows the need for "case reports" extending over years and not merely over a few weeks or a few months.

It shows why many people need good advice rather than a "little medicine."

It shows the value of a seventh day of rest and of an occasional vacation and an annual vacation in the country.

It shows why hospitals should be located in the suburbs rather than in the heart of large cities.

It teaches why many of the common ills or symptoms are to be looked upon as blessings in disguise—as warnings to be heeded.

It puts a different interpretation on the old saying, A sound mind in a sound body.

It shows the need of full co-operation between patient and physician and that free discussion is necessary to arrive at the truth.

This list could be extended indefinitely. Perhaps needless to say it takes time to go over accumulated data and digest facts and draw conclusions.

General sanitation is the duty of the community and of the State but there will always be problems that are purely personal. Every one should have sufficient education to properly choose a private medical adviser. The family physician still has a place in our civilization. He must "supervise health" and advise his patients how to prevent ill health and diease. In the case of actual disease he may be able to direct his patient to the proper specialist, and he must constantly stand between his patient and the operator.

The theory of Coniosis allays the fears of specific diseases and on the other hand it creates a pure air conscience. A sensible man does not become an alarmist.

The mere ability to live under bad air conditions, to tolerate, is not synonymous with adjustment or adaptation. A "return to the simple life" can scarcely be considered a remedy; few care to return to such a life after having lived a complex city life. The proper remedy is to make the city sanitary.

Although sanitary science has markedly decreased the prevalence of many specific diseases, the decrease of common ill health is less noticeable. We must distinguish between individual and communal effort; some com-

munities are backward and some individuals are heedless. (Shall we go a step further and say our cities will not be properly cleaned until women are given a voice in the management of municipal affairs?)

Coniosis needs to be taught, it should be taught in the schools. It shows why schools should be located under sanitary surroundings and why cities should clean up and keep clean.