

# THEORIES CONCERNING THE CAUSATION OF DISEASE

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[The following article was prepared some years ago by the author with the aid and assistance of Professor Selskar M. Gunn. It was intended to be one of a series of essays to be successive chapters in a volume for laymen treating in a general way of the problems of public health. This project, disturbed by the war, is not now likely to be completed, but since the presentation here is novel and represents considerable literary work, and is furthermore instructive, it has been taken by the JOURNAL for publication.]

## THE DEMONIC THEORY

Man's common belief as to the causation of those "thousand ills which human flesh is heir to, has always been fairly compatible with the general state of human knowledge. It has always been pretty well related to the state of civilization and learning of the race or country. The savage of today and the races of antiquity are at one in their reliance on what is often spoken of as the demonic theory.

According to this theory, disease was produced by demons, one or more evil spirits had fixed their abode in the victim's body. The sick man was possessed of a devil. It was therefore logical to attempt to cure him by a system of incantation and sorcery, something calculated either to drive or coax the demon out. Disease was conceived of, not so much as a condition of the body itself, as an entity apart from man which dwelt with, or even replaced, the soul within its ordained temple. Savage or primitive imagination pictured a great world of things unseen and supernatural and from this world the fathers of the race drew the characters who were assigned to play the villains' parts in the great struggles of the mortal body with its invading

maladies. The association of religion with primitive medicine was very close. The priest or man of religion was usually the medicine man or doctor whose good offices were required for exorcising the evil spirits of disease.

Much has been written of the history of primitive belief in the demonic source of disease and of the superstitions connected with its cure. These superstitions and the practices they direct were often very fantastic and interesting. Unhappily some of them still survive in many of the most highly civilized countries. In our own country a great many of these beliefs are still practiced among the laity, especially among the illiterate of the more remote country places. Magnetic rings are still worn for the cure of rheumatism. Dried potatoes and horse-chestnuts are still wearing holes in many a trousers pocket, parents are still making their children the object of their little friends' ridicule by compelling them to wear bags of assafoetida to keep off communicable disease. Breaking a mirror, beginning a journey on Friday and a host of other ridiculous, inconsequential notions about ill luck are still unexploded in the minds of a great many people. Successful men of business and refined modern women, well informed about most things, continue to believe charlatans and quacks simply because they are not informed as well upon the subject of their own bodies, how they function and what will interfere with those functions, as they are about the workings of an automobile or even the principles of international law.

## THE PUNITIVE THEORY

The association of religion with the cure and treatment of sickness probably had much to do with the evolution of what we may call the punitive theory of

disease; the belief that one's attitude toward the deity was responsible as a cause of sickness. From a period centuries prior to the Christian era down to the present time, there have been good people who have believed disease was a punishment meted out by an outraged God for the sins of the individual or the race.

The old Testament bears evidence of the currency of this notion among the Hebrews of Bible time. We are told that Jehovah is a jealous God, we find him recorded as rewarding his chosen people in divers ways and as sternly punishing them in his displeasure. In II Chronicles, Chapter XXI, there is related the story of a terrible plague in which the whole nation suffered for a sin of David and which was stayed only by David's repentance and the making of a sacrifice.

Following out this theory an afflicted individual or a plagued people instead of cajoling evil spirits, sought to be healed by propitiating the deity. Piety, repentance of sin, prayer and sacrifice were esteemed to be of great value. As we have seen, David built an altar and made sacrifices. Jehovah saw that he had turned from evil, the divine wrath was appeased and the plague was stayed.

In accepting this record of Hebrew life and religion literally, the early Christian Church quite logically found a place for the punitive theory of disease. Special prayers and services, special rituals and even special saints, who should intercede for the victims of disease, came into being. The heated religious controversies of the Dark Ages are full of references to this subject. The best means of petitioning relief from disease was regarded as a religious question. The terrible outbreaks of bubonic plague which ravaged Europe in the late mediæval and early modern period gave the church an occasion for directing its energies to this matter.

#### THE MIASMATIC THEORY

After long years we begin to emerge from the "thousand years without a

bath," which made up the brilliant Age of Chivalry, and begin to hear more about the miasmatic theory of disease. That curious notion of vapors or miasms coming up out of the ground and striking down the people with disease was not really born at the time above mentioned. It had been suggested long before by the Greeks and the Romans. After being buried for centuries under the stupendous weight of middle-age superstition and ignorance, this old idea began to revive. The people, who believed in this, said that the air arising from certain kinds of ground, especially low, swampy areas, was a cause of disease. Certain places were thus given a very evil reputation, because the ground was said to exude some invisible, insensible vapor, some miasm, which produced disease. Such places were spoken of as unhealthy spots. Not only was the air of swamps miasmatic but so also was night air. The clever fellows who invented miasms have been the unwitting cause of much trouble on the part of modern physicians, who cannot get out of their patients' heads the persistent old superstition that, if they breathe the night air, all sorts of trouble will result. The fact that malaria was prevalent in the vicinity of swampy land, and some evidence that people who ventured out in these swampy places were more likely to get the disease, lent plausibility to this theory and it has been an almost hopeless task to dislodge it from the minds of a great many people. It was the belief in the air as the causative agent that gave malaria its name, the Italian for "bad air." Somewhere in the inexhaustible fund of interesting information which he drew upon so freely to supplement his vivid imagination, Shakespeare found this miasmatic conception of disease, for, in his Julius Caesar he makes Portia say to Brutus, who has been walking in the garden in the small hours of the night,

"Is Brutus sick? and is it physical  
To walk unbraced, and suck the humours

Of the dank morning? What! is Brutus  
sick,  
And will he steal out of his wholesome  
bed  
To dare the vile contagion of the night,  
And tempt the rheumy, unpurged air?"

This quotation expresses the whole idea of miasms, namely that the air is contagious, that the "contagium" or cause of disease is in the very air itself.

The wise old heads who invented miasma were really beginning to be scientific after all. At least, they were searching for a material, natural cause, instead of blaming it all on either a god or a devil. They were great, in that they had the fundamentally important conception, that something cannot come out of nothing. Even the suggestion that night air in low swampy places was disease-laden was not so bad in one sense. The old physicians simply reckoned without the active anopheles who is so particularly blood-thirsty at night.

These three conceptions of the origin of disease are the ones that have been practically universal. They are the ones that have taken their place in the popular fancy and have woven themselves into the history of nations, that have left their mark upon the folk lore and the earlier literature of many peoples.

#### BEGINNINGS OF MEDICINE

The lore of medicine had its own sequence of more professional theories regarding the etiology of disease, generally more complex, but often no less fantastic and artificial in the light of science, as we now regard science, than the more simple beliefs which held sway in popular belief. This is not a history of medicine but a brief reference to some of the great names in the chronicle of the healing art and some of the theories which these men stand for cannot be omitted.

If we hark back to Greek mythology we think naturally of Aesculapius, the physician to the gods, and of his daughter Hygiea, the Goddess of Health, whose name is now applied to almost

everything that stands for the prevention of sickness and the preservation of the human species in a state of health. It did not take the invention of modern scientific apparatus or the discovery of bacteria to bring forth some very creditable theories. Men of learning always have and always will exercise their minds with speculation concerning those things from which the dark curtain of the unknown has never been drawn aside. When "demos" pronounces that this is the end, the scholar, the man of real genius, will say, "They think this is the end, I will find out what lies beyond."

On the Pillars of Hercules the ancients wrote, "Ne plus ultra," but there was one who refused to believe that there was the end of the world. Science has had many a Columbus. When the physicians of 50 years ago said, "spontaneous generation," Pasteur already saw beyond the reach of their vision, into the world of virus ferments. When men of inquiring mind cannot lay hold of facts with which to build they are apt to raise a structure of fancy more or less logical. This is what happened in medicine and upon this sort of basis grew much of the art of healing.

In the Golden Age of Athens, contemporary with Pericles and the illustrious fathers of so many arts, lived Hippocrates, "Father of Medicine." In that early time we find this man already recognizing disease as a process within the body, a process dependent upon natural causes and subject to natural laws. Hippocrates (460-370, B. C.) instituted personal treatment in the place of exorcising spirits, sacrificing to unresponsive deities and other "absent treatment." The Hippocratic treatment and the Hippocratic theories had little real science in them; they were speculative theories as we may readily understand. There was nothing of anatomy behind them worth the name; there was no knowledge of physiological function beyond that gathered by every man from the casual observation of the "modus

operandi" and habits of his own bodily organs, but they were valuable as the opening wedge for the recognition of natural as opposed to supernatural causes.

#### GALEN AND THE FOUR HUMOURS

The theoretical structure begun by Hippocrates, or at least based upon his observations, was elaborated and described by Galen (331-201 B. C.) and is known as the theory of the four humours. It was conceived that there are in the normal body four humours in a definite amount and proportion. Any excess of any one or any irregularity in their distribution disturbed the fine adjustment of the "going machine" and health was transformed to sickness. These humours were blood, phlegm, yellow bile and black bile. The idea of the humours is the real reason for the practice of blood-letting. It is hard for us with our present wonderful (though still grossly inadequate and incomplete) knowledge of human physiology and pathology to conceive a more inane method of treating a man already weakened with disease than this indiscriminate practice of blood-letting.

#### SYDENHAM'S TEACHINGS

Sydenham (1644-1689), often called the English Hippocrates, first gave us the important thought that there are different specific things which should be held responsible for different diseases. Sydenham held that disease was the result of the effort made by the body to throw off, to expel these *materies morbi*, the dead materials within it, which had made the trouble. The important result of Sydenham's studies was that a little close intelligent observation upon the part of the doctor is worth more than any amount of dosing administered in blind observance of a preconceived notion. It was a step away from the four humours and from other later, but quite as artificial, theories. In short, Sydenham did much to teach the medical profession the value and importance of "studying the case." Sydenham's theory,

more or less mixed up with the really inconsistent four humours, probably had much to do with the long popular belief in "peccant humours of the blood," the quaint notion which asserts that a rash or eruption must "come out" and the more it comes out the better for the patient. Dr. Woods Hutchinson describes this stage of medical progress in connection with a discussion of certain of the diseases of children in the following words. "They were regarded not merely by the laity but by grave and reverend physicians of the Dark Ages as a sort of necessary vital crisis peculiar and appropriate to each particular period of life—a sort of sweating out and erupting of 'peccant humours' of the blood, which must be gotten rid of or else the individual would not thrive. Incredible as it may seem, so far was this idea extended that the great Arabian physician-philosopher, Rhazes, actually included smallpox in this group, as the last of the 'crises of growth' which had to appear and have its way in young manhood or womanhood." Quaint little echoes of this simple faith still ring in the popular mind, as, for instance, in the wide-spread notion about the dangerousness of doing anything to check the eruption in measles and cause it to "strike in." Any mother in Israel will tell you, the first time you propose a bath or a wet pack to reduce the temperature in measles, that if you so much as touch water to the skin of that child it will "drive the rash in" and cause him to die in convulsions. And, of course, one of the commonest of a physician's memories is the expression of relief from the mother or aunt in many of these mild eruptive fevers, where the skin is well reddened and spotted: "Well anyway, doctor, it is a splendid thing to get the rash so well out." Until very recently it was no uncommon thing to hear the parents say, "There is a run of measles, but I suppose we might just as well have Johnnie go on to school and get the disease and have done with it. It seems to be the real mild sort this

time." Of course this view was scientifically shattered two or more decades ago by our recognition of the infectious nature of these diseases, but practically its hold on the public mind constitutes one of the most serious and vital obstacles in the way of the health-officer when he endeavors to attack and break up an epidemic of measles, whooping-cough, or chicken-pox."

#### HAHNEMANN AND HOMOEOPATHY

Homeopathy, in its essentials, is founded on the theory of Hahnemann, who urged that disease is due to some spiritual influence, that it consists of its symptoms taken collectively, that it may be treated by the removal of those symptoms and that this result is to be obtained by introducing into the body of the sick person, in small quantities, such drugs as have been found to produce the identical symptoms in a well person. The whole fabric of this scheme is highly artificial and it was put forward by a man who was a theorist first and an observer and student of the human body and its ways only incidentally. In our day, when facts count for what they are and not for what we should like to have them, it is naturally unsatisfactory in its whole structure. The school of homeopathy, as it remains with us today, has almost, if not entirely, shaken off this fanciful chain of reasoning by which, under Hahnemann, it was bound up with the empiricism of an earlier and even less enlightened period and the homeopathic physicians of today actually make use of much the same methods in diagnosis and treatment of disease as the so-called "regular" or "old school" physicians. The true physician,

under whatever name or creed he may have entered the communion of the healing art, must in this day deal in fact, not theory. He must be, above all things, broad-minded and well informed; he must be ready to accept and to employ the discoveries of science as soon as their therapeutic value be established upon a firm basis in accordance with the most reliable tests of modern experimental medicine.

#### EARLY SCIENTISTS

There are a few other names which should not be omitted in bringing the story within reach of modern science. Among these are Vesalius (1514-1564), who made anatomy a science; Harvey (1578-1657), mentioned in every school physiology, who discovered the circulation of the blood and first announced the function of the arteries, till then believed to be air passages from the fact that they were found empty after death; and Leeuwenhoek (1632-1723), whose invention of the microscope opened to scientific investigators the hitherto unseen world of the infinitely small in which develop the causes of many of the ills that beset us. Kircher and Malpighi should be mentioned, the technicians who gave the first suggestion that the newly found microscope was to be the real discoverer of the causes of many of the diseases; and Jenner (1749-1823), famous for the introduction of the first scientific use of a biological prophylactic, inoculation. These men paved the way, so to speak, for the great modern leaders in bacteriology, Pasteur, Lister and Koch.



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