Mc Elroy (Z. C.)

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OF THE

FEVER PROCESS

IN LIVING HUMAN BODIES.

By Z. Collins McElroy, M D.

DELIVERED BEFORE THE MUSKINGUM COUNTY MEDICAL SOCIETY.

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THE FEVER PROCESS.

Until there is some generally, perhaps it were better to say universally, accepted doctrine of fever to serve as a basis, it does not seem to me that any particular type of fever can be very profitably studied by itself. That such a doctrine does not exist is not due to a lack of consideration of the subject in the past by at least some of the very best cultivated minds in the profession during many centuries; for the existing literature in the English language alone on fever and fevers would absorb in its bare reading the bulk of an effective life, even if protracted beyond the average of duration. They have, in all their various phases, been studied patiently, diligently, and, as I believe, exhaustively from an objective point of view. No investigator, as an observer simply, can hope to become the discoverer of new facts from this point. The subject, as presented by the literature of the profession, is excessively complicated with specificities, classes, genera, species, and varieties of type and form of a process which, in the nature of things, is in itself a unity.

Future study will certainly present novelties in simplifying its existing complexities, for it seems to me that these complexities are all of human invention, and have no existence in nature or fact. Much of the current views of fever in the professional and popular mind are the products of men's imaginations in the theological era of human history. With none of the facts of physical science in our day to guide investigation into the essential nature of the fever process in living bodies, it came to be regarded as essentially the work of the devil and in the interest of death. Fever

or fevers have, therefore, all along through the past, and up to the present moment, been regarded as enemies, and the whole array of "drugs and medicines" leveled at them with a view of arresting them, or "stamping them out." With the facts brought to light in our day by physical science, this doctrine can not be maintained—will not bear investigation. All remedial measures aimed at annihilating them have failed, and will continue to fail on indefinitely forever. Nature's work is not convulsive, but by the slower processes of evolution. I say, therefore, that these convulsive efforts at stamping out fever have failed, with the apparent fact before me of the arrest of certain types of fever by bark or its alkaloids. The arrest of any given case of periodical fever is by no means a certainty, before hand, by bark or its alkaloids. The failures of bark to do this are quite as conspicuous as its successes, or apparent successes; for it seems to me that in the bulk of cases, even where the fever is apparently arrested, that it is so, in fact, only so far as the work of a fever process has been finished at the time of its interruption; for relapses and return are the rule, and complete restoration to health the exception, until after the purposes of fever have been accomplished. I have, as all of us probably have, had repeated failures to arrest fever by bark or its alkaloids, and patients refuse to take it longer because of its failure to cure them.

Our own great Doctor Rush declared nearly a century ago that there was but one fever; and that the attempt of nosologists to map them into orders, genera, species, and varieties was no more successful than an attempt to map and describe the ever-changing forms and types of clouds in the firmament on a windy day. And he lived in the day when the methodical division of fevers of the Edinburgh school, exemplified in "Good's Study of Medicine," held complete control of the professional mind of the world, or, at least, the English-speaking world. But nosology is now no longer cul-

tivated in the medical world. On the contrary, the very latest authorities, conspicuous among them Stokes, of Dublin, in his just published "Lectures on Fever," tells us to study the resemblances of different types of fevers to each other, and not the differences between them; that they are correlative, that is, ~~naturally~~ mutually convertible into each other's types, and instances the interchangeability of typhus and typhoid, etc.; but, above all, study their "periodicity," by which, it seems to me, he means their course and duration.

The problem of fevers now is, "What is their essential nature?" Are the phenomena presented by living beings, known as fever, in the interest of life, or are they in the interest of death? For whoever solves this problem for himself masters the subject for the purposes of the actual working practitioner at the bed side If these phenomena are in the interest of death, the war on them, using the whole available materia medica as ammunition, should go on, despite the failure of the enterprise during so many centuries in the past. But, from sheer exhaustion in our day, the war on typhoid fever has ceased, or mainly ceased, and the best and most successful remedial management is that known as "expectant"—to do nothing where there is nothing to be done.

What, then, is the essential nature of a fever, regarding all the types of fever, for the moment, as a unity? For if the purely imaginary factors of specific differences, as regards causation, variations of phenomena, and terminations, be admitted in the equation, no result which will include all the factors concerned is ever likely to be reached. In approaching the study of this problem every assumption must be dropped out of consideration.

There are, in fact, so far as observation and experimentation have been able to identify, only two modes by which the occasion or necessity for a fever process in a living body may be brought about, viz., from material introduced from with-

out, "storing up force" capable of modifying the processes of repair and waste of tissue, and, as a result, modifying the dynamic capacities of the tissues, presenting, when these modifications of structure seriously impair function, the alternative of their removal by a fever process, and reconstruction from new material, or the death of the individual; the other, by material produced within the living body, partly by modifications of external conditions of force (meteorological changes), which, failing to be eliminated or rendered harmless by chemical decomposition, modifies the processes of repair and disintegration of tissues, resulting in modifications of their dynamic capacities or normal functional capacities, with the alternative of their gradual removal by a fever process and reconstruction from new material, or death of the individual.

The evidence I have been able to obtain by observation bearing on the causation of typhoid fever, places it, in the bulk of cases, in the latter category, viz., the causation being generated in the body of the sufferer, though not universally. While the whole catalogue of so-called specific or eruptive fevers, including typhus, syphilis, whooping-cough, gonorrhœa, etc., are as clearly in the first class in the great bulk of instances, though, it seems to me, that what are called "epidemics" do not receive satisfactory explanations from this cause alone. All these special types, as they are called, had a beginning, not from contagion, which might, with similar conditions, be repeated, and hence arise *de novo*, but in the main they are brought about by external causes, viz., material storing up force, which, introduced into a living body, modifies the processes of repair and waste of tissue, resulting in like loss of dynamic capacities, necessitating a fever process for removal and reconstruction from new material, or death of the individual. Instances of death at the beginning, or prior to the beginning, of a fever process are seen

in the so-called cold plague, pernicious remittents, or sinking chills.

The whole train of phenomena of a fever, its causation, progress, and results, brought about by circumstances altogether within the control of the observer, and at almost any time can happily be studied in the expedient of vaccination. It seems a very simple thing, and so it is, but its very simplicity conceals its importance, and effectually prevents recognition of its lessons in the study of the essential nature of fever. Were it an exceptional phenomena of rare occurrence, it would receive more attention.

The train of phenomena brought about by the act of vaccinating an unprotected person, embraces in itself every thing connected with a fever process, no matter what its cause, type, symptoms, or duration; for, in the progress of the *vaccine disease*, so called, in different individuals, and under different circumstances—external conditions, and conditions of bodies at the time the virus, so to speak, is introduced—there is no want of resemblances to all other types and forms of fever recognized in the literature of the profession, including various sequelæ and occasional death.

In vaccination there are—

1st. The introduction of a so-called "virus," composed of materials natural to living bodies, but differing from any natural compound in its peculiar chemical structure, which stores up, in virtue of this peculiar chemical structure, a mode of force, which, though wholly inoperative elsewhere in nature, in a living body modifies the natural processes of repair and waste, or construction and disintegration of tissue, and of the molecular arrangement of the materials of structure of living human bodies, in such a manner that a repetition of the phenomena is, in many cases, impossible through life, though not all.

2d. The stage of incubation, as it is called, the time required to modify tissue, and the materials of which future

tissue, in part, must be formed, existing in, or introduced into, the body, after the introduction of the virus, so that function is impaired, and the fever process set up for its removal and reconstruction in the modified manner, that a repetition of the same process can not be repeated through life.

3d. The decisive failure of function announced by chilliness, cessation of appetite, which is the demand for new material, succeeded by elevation of temperature, the fever process varying somewhat in different individuals in intensity, course, and duration.

4th. Stage of convalescence: a removal of the demand for new material, announced by return of appetite, gradual resumption of function, as the reconstructive processes are completed, and, with many exceptions, as occasional permanent damages to structure, or even death itself, a return to apparent or real condition of health. The result—immunity from the effects of the virus which produced the fever, as well as from the effects of a still more active virus, smallpox, sometimes for life; in other instances for longer or shorter intervals; in others, again, to be susceptible to their effects, but in a mode greatly modified in intensity and duration, at all times.

A careful study of these consecutive phenomena really uncovers whatever secrets there are to any of us in the fever process, and supplies the matter for a more or less truthful and trustworthy answer to the question, What is the essential nature of the fever process in human bodies? Is it, in its purposes, conservative, and in the interest of life? or is it in the interest of death? In other words, is it the work of the devil?

It must be noticed that in vaccination the mischief to structure takes place before the algide shock—chill—which is the unmistakable announcement that a more or less serious disturbance to structure has already taken place, here as

well as in other forms of fever, often with an apparently local point suffering more seriously than the remainder of the body. This local point is where the changes of structure have progressed to the extent of bringing it within the scope of human observation, sometimes with the naked eye, at others to the assisted eye. In vaccination the local point is very plainly visible to the unassisted eye of the observer. If there is no fever process set up for the removal of tissue, modified so as to seriously impair function, then there is speedy death, as with so-called pernicious fever; or apparent recovery takes place, with some permanent alterations of structure, to be known henceforth during the life of the individual as some incurable chronic disease. But the fever process being set up, a more or less rapid or gradual combination or removal of the modified structure goes on, and a full recovery may take place if the capacity to reproduce natural structure from new materials has survived in the midst of the molecular changes of structure. This capacity resides in the structures themselves, for it is one of the harmonies of organic nature that the main purpose of all life, animal or vegetable, is to provide its own preservation, reproduction, and multiplication from new material, as seen in its simplest form in a vegetable seed. We say wheat is ripe when the grain is perfect; that is, when the plant has provided the means for its reproduction and multiplication in a seed, the parent plant is dead. Wheat ripe, wheat dead; its mission in organic life finished.

So, in the act of functional decay of the various organic structures composing an individual living body, each special kind stores up the force, in the necessary material, for its own reproduction from new material. For the separation of this peculiar material, this seed of the structures, so to speak, from the general débris of the tissues, and its restoration at a proper time and place to the circulation, with new material, to enter upon its work, there exists in all complex

animal existences a complicated and widely distributed apparatus called the lymphatic system. The lymph, as it enters the blood current near the right auricle, is the seed of the structures, from whence it has been derived.

Now, if the capacity to store up the force for their own reproduction from new material has been lost by any of the structures, or the lymphatic system has shared the same fate, so as to incapacitate it for the performance of its function by any means, be it virus, malarial, chemical, or mechanical, the inevitable result is death.

And so, if the damage to any given structure be so great, previous or subsequent to the lighting up of the fever process, that it can not provide or store up force for its own reproduction from new material during a fever process, if death occurs, it is said to be due to some lesions of this particular structure, be it enteric glands, as in typhoid fever, or stomach, or brain, or nerve masses, or wherever there is a failure of structure, as definitely announced by loss, or important modification of function, be it called inflammatory, softening, or any other of the fanciful names given to appearances by pathologists.

It seems to me the conclusion can not be resisted that the essential nature of fever is conservative, intended to remove structure, tissue, which has lost its physiological, or natural dynamic, or force-producing capacities; for, in its decay by the fever process, the principal dynamic result is heat, to which may be added, as an occasional result, an exaggerated or distorted imitation of natural function, as delirium, spasms, pain, etc., and by these means save the life of the individual. In most cases called severe, a large part of the tissues existing at the commencement of the fever process disappear before convalescence is complete.

With this understanding of the essential nature of fever, the pathology becomes transparent enough for any of us to understand; for if there were no spoiled tissue, so to speak,

to be consumed, burnt up by the "burning disease," the fever process, there would be no necessity for a fever process, and none would occur or take place. And the bulk of the mischief to structure has already occurred prior to the commencement of all fevers, just as it was seen to be after vaccination and before the fever process was set up. The modifications, or changes of structure, are antecedent, the fever process the succeedent, and in its purpose and nature is essentially conservative, in the interest of life, and not the work of the Evil one. If there were no failure of function on the part of any of the structures of a living body, there could be no antecedent alterations of structure, and none of us could ever know we were sick, in fact never could have a fever.

Whoever would manage fever, clinically, must study and comprehend its nature, course, and possible and probable results, if he desires to be useful to the sufferer. The actual working practitioner must bear in mind constantly that the fever process is not the work of an enemy, but that of a friend to the life of the individual; that its end is salutary, though death may take place, apparently, as a result. But death would occur without the fever process in such cases, and it would then figure in mortuary statistics as some form of "heart disease," or "brain disease," or "hæmorrhage," or "blood poisoning," or "bowel complaint," etc.

In the remedial management of fever cases, it is well to keep constantly in mind that it is not necessary to be pouring "drugs and medicines" into bodies of patients all the time; that the main duty of the physician is to watch and wait, and do nothing until there is something to do. It may be that the fever process is taking place too rapidly, as evidenced by high temperature and accompanying rapidity of blood circulation, adding no little to the danger in which the suffer is already involved. There are ample means for slowing speed. Never forget that effete matter, matter unfit for the further purposes of life, is accumulating in the body

exactly in proportion to the rapidity of the process of combustion, and as measured by the heat evolved, which, if retained, will certainly add no little to the trouble already in existence, that is, give rise to additional pathological changes of structure. I think it may be stated as a rule from which there are no exceptions whatever, that the human body has no enemy in nature so formidable as the results of its own decay, not only in health, but in sickness, where the danger is multiplied many times. It is, therefore, of the first importance to ascertain, at short intervals, that it is actually evacuated as rapidly as it is forming. This evacuation will occur in the gaseous forms principally at the lungs, though some vapors will escape elsewhere; the liquid at the skin and kidneys, the latter, the urine, holding in solution by far the most noxious material escaping from the body, because in the laboratory of the body this material, excessively complex, is not, and probably can not be, reduced to simpler chemical conditions, or gaseous states, safely; and something scarcely less noxious will escape from the rectum and bowels. If nature, however, is doing this work well in any case whatever, we, as physicians, should withhold our hands of interference. If she fails, study attentively in what, and the mode of failure, and by our art and the "stored up force" at our command in medicines, imitate, as far as may be, her natural processes. Do not go beyond, or thwart nature, if her motives are not clearly malevolent, as they would be in blood escaping from a severed vessel.

I read many reports of cases in journals, and hear them reported in societies, in which, it appears to me, the cases are made as they progress, by unwise or needless interference, or total neglect of interference on the part of medical men. I think natural evacuations should be interfered with with great caution. Modern pathologists speak of the caseous or tubercular deposits, so called, almost always found in post mortems after fatal cases. These are doubtless effete mate-

rials which crystallize for want of water to hold them in solution. The water supply is, therefore, of the very first importance, far more so, in the bulk of cases, than "stored up force" in "drugs and medicines."

Watching, waiting, regulating of necessary speed; getting rid of the débris of the wasting structures, imitating nature as near as can be, observing the utmost promptness in clearing away from the person, and out of the room, material escaping from the body; in a word, enforcing the utmost cleanliness, are the prime duties of the medical attendant.

If the patient is to recover, the tissues have to be reconstructed from new material, to a greater or less extent. This material must be supplied; therefore food, in such states as to be used by the body with the least expenditure of force in its reconstruction, is one of the most important features of professional management of fever cases. In small quantities, and frequently repeated, best suits the diminished powers of assimilation always existing in every fever patient; and milk, because it supplies every article needed by a body in health, stands first on the list, but not to the exclusion of other things.

With such knowledge of the beginnings, aims, progress, purposes, and ends of the fever process, it seems to me none of us can fail to be less bewildered during the progress of any given case, and every case, than I was when I regarded the fever process as the work of an enemy—the Devil—which I certainly did in the commencement of my career, thirty years ago. This is the popular conception now; and judging from the literature of the profession, it still lingers in the minds of those who occupy positions to lead the professional mind of the world.

The conclusions to which my clinical studies of fever have led me may be stated somewhat as follows:

1st. That before a fever process of any type or form can

occur in a human body, there must be some antecedent modification of the dynamic capacities of structure.

2d. That these alterations may occur from internal causes, that is, from material acting as a virus, formed in the body, as in many cases of so-called typhoid fever, but not all.

3d. That these alterations may, and in fact, in the bulk of fever cases, do occur from material—gaseous, fluid, or solid—introduced from without, which acts by modifying the processes of repair and decay of tissue, resulting in modification of force-producing properties; as well as by external conditions, as meteorological changes, etc., acting in a somewhat similar manner, and with like results.

4th. That the fever process in a human body, irrespective of type or cause, is a conservative process, in the interest of life, removing, by the slow process of combustion, or chemical decomposition, structure which has either wholly or partially lost its physiological functional capacities; and its reproduction from new material, with physiological functional capacities, sometimes, and in the bulk of cases of so-called eruptive fevers, so modified as to be incapable of being disarranged to the same extent by a like cause through life, *i. e.*, self-protective against second or repeated attacks, so called.