be found better places to observe the natural history of circulatory phenomena in the mucous membranes; anemic, passive or congestive; ecchymotic, infiltratory, inflammatory or ulcerous; than just in those places exposed by laryngological aid, or to follow the clinical progress of specific and other infectious processes, of morbid growths, or of tuberculous infiltration? In the opinion of the great Virchow, "the larynx is the very best place to study tubercle." So likewise the corollaries of many dermal diseases are seen in these mucous membranes modified by difference of structure, sometimes as though developed in the sodden skin. Here again will be seen the manifestations of the exanthematous diseases in advance of their cutaneous evidence. In this region, too, diphtheria is first detected, often happily in time to avert all perilous constitutional involvements. Anemia of the laryngeal mucous membrane may be the first manifestation of constitutional tuberculosis; epiglottitis, the first symptom of enteric fever, and edema of epiglottis and larynx, the first suggestion of renal insufficiency. Nephritis and diabetes are sometimes first suspected by the evidence disclosed on laryngoscopic investigation; and the advanced stage of the latter malady is sometimes indicated by ulcerative processes attributable by exclusion to no other systemic condition.

Laryngologic inspection and the sequels of topical treatment of diseased conditions under its aid, have taught us that much which is deemed rheumatism is really infectious arthritis, infectious myositis or myalgia, originating in bacteriological changes in the mucous membranes and glands produced by disease or by interference with disease, and projected along lymphatic or circulatory channels to structures at a distance. This lesson demonstrates the importance of hunting within the diseased body for processes actually autotoxic, instead of speculating too much upon the introduction of toxic processes from without.

This brings to mind how much laryngorhinology is contributing to bacteriologic studies of great import to general medicine. The various organisms found normally in the different cavities and their adnexa in health; the metamorphoses taking place in many of them under various exposures and under the influences of various systemic diseases; the introduction of foreign bacteria under climatic and infectious influences and the changes that these undergo, can be well studied in the domain under consideration.

Respiratory diseases are largely sequels of rhinopharyngeal and laryngeal disease, sometimes by direct extension, as in chronic bronchitis, sometimes by obstruction, as in emphysema, sometimes by reflex neurosis, as in asthma. Round shoulders, pigeon breast, deflected spine are often the sequence of impaired nasopharyngeal respiration, and most frequently consequent upon the presence of lymphoid enlargements at the vault of the pharynx.

DISEASES OF THE CENTRAL NERVOUS SYSTEM.

The close circulatory relations between intranasal structures and cerebral meninges are sufficiently intimate to admit of transference of morbid products and traumatic injury from one region to the other; and thus serious cerebral complications, structural as well as functional, may follow in consequence of disease in the rhinopharyngeal regions.

Doubtless some of you have had the gratification of saving patients from commitment to insane asylums by correcting or curing some intranasal or rhinopharyn-

geal lesion; or have rescued an inmate from an asylum for idiots by wrenching lymphoid hypertrophies and proliferations from the fornix of his pharynx.

DISEASES OF THE PERIPHERAL NERVOUS SYSTEM.

Turning now to the peripheric nervous system, allusion may be made to frontal and other headaches, to asthma, to repressed and impaired intellection, to night terrors, to convulsions, to epilepsy and to insanity, directly due to intranasal and pharyngeal disease, and upon the removal of which depends the cure or the best possible measure of relief whatever it may be, but in either instance unattainable by administration of neurotic drugs.

Some cases of special neural diseases, central and peripheral, are to be suspected or detected in their earlier manifestations solely by laryngological investigation. Thus bilateral paralysis of the adductor muscles of the larynx is often the first intimation of a progressive locomotor ataxia; and its recognition sometimes suggests the only method of securing immunity from the risk of sudden death by spasm of the larynx. Unilateral paralysis of the recurrent laryngeal nerve is often the very first and sometimes the sole method of recognizing the existence of an aneurysm of the aorta; as it is often the first intimation of the development of esophageal and other intrathoracic neoplasms.

Thus without going further abroad to hunt up analogous examples, it must be admitted that the whole domain of medical practice may be more or less intimately associated with primary lesions in its laryngologic and rhinopharyngeal territory; this but emphasizes the thought in the development of which this address was begun, namely, that the practitioner of diseases of the throat and nasal passages should be at least competent to practice general medicine, in order to do justice to his specialty and to contribute the best that his specialty has to offer in the interest of his patients.

1824 Chestnut St.

HUMAN TEMPERATURE IN DISEASE.*

NORMAN BRIDGE, M.D.

LOS ANGELES, CAL.

We are always seeking for symptoms that tell the exact nature of the diseases of the human body. If there were idiopathic signs the people would learn many of them, and hardly need doctors, except for the mysteries of treatment; and even these they would more or less master in time, as now they often think they have mastered them. The doctors are alert for the smallest hint of a new sign that can show without error the goings-on in the sick body. The treatment of disease troubles us rather less than the diagnosis; and we are usually more chagrined at our errors of diagnosis than at blunders of treatment.

The temperature of the body in health is maintained at a given point, with slight fluctuations, in all climates and conditions; and it fluctuates peculiarly in disease, and probably with some approach to a typical manner. How these mutations may be discovered and so the clinical thermometer be made more effective in practice has been a long search of the profession.

The temperature of the body in health is kept near a normal line by a regulating mechanism somewhere in the nervous system. More heat is usually made by muscles and glands than is necessary, and the regulation point is chiefly maintained by varying loss of heat, due

*Read before the Association of American Physicians, Washington, D. C., May 3, 1900.

mostly to the changing size of superficial vessels produced by the muscular fibers in their walls. These fibers are controlled by nerves, and so by nerve-centers.

In fever there is a regulation point as truly as in health, only it is higher and less constant. With its rise and fall there are frequently attendant symptoms that are curious and paradoxical, although probably conservative, as the subjective sensation of cold with a rising temperature and of heat with a falling one. It is not true that more heat is generally produced in the body in fever than in health under full exercise, but the contrary. It is only the regulation point that always rises.

What makes the regulation point rise? Why do the nerve-centers controlling the heat manufacture and dissipation change their force and action under certain influences which we call causes of disease? These questions go at once to the core of the clinical phase of the subject.

Doubtless several pathologic conditions produce the rise of the regulation point, and the accidents to these factors may cause all of the fluctuations. There is no great change in the regulation point below the normal; whenever, therefore, we speak of a change we mean a change above the physiologic par, and that is fever. Yet there are disorders, of a chronic sort mostly, in which the temperature is for weeks or months slightly below normal at certain or all times of the day. Myxedema is one of them.

The tendency of professional thought is now toward attributing all fever to certain substances in the blood produced by microbes or to the microbes themselves. The proof of such toxic influences is overwhelming, but they are not the sole causative forces. And if we shall ever be able to catalogue all the causes we shall need to discover the one essential factor in the complete solution of the question—namely, the manner in which the nervous regulating machinery is ultimately affected by toxins or what not.

In studying the fluctuations of temperature we may profitably set a few things we know over against some that we do not know, and so hope to gain some practical lessons for the more efficient care of the sick.

1. We know that pus poison—that is, the micro-organisms of pus and their products absorbed into the general circulation—causes fever. We probably often encounter fevers that we fail to understand, which are due to small accumulations of pus hidden away somewhere in the body; but that is no justification for the assumption that in every inexplicable prolonged fever such a source of poison must exist.

2. Dead tissue, as the products of changes in greatly overworked muscles, the albuminous bodies set free from these tissues, and floating in the blood, probably cause fever.

3. Slight elevation of temperature is produced by absorption of albuminous toxic substances from cyst cavities in various portions of the body, as the skin, the scalp, and the ovaries, that leak into the connective tissue about them and undergo absorption. These are not the products of pus poison.

4. Then we know that certain poisons, almost positively microbic, are taken into the body from the air, or in food and drink, and produce fevers—with possible eruptions upon the skin—which run a distinct course and terminate spontaneously if the patient lives. The fever begins after a period more or less definite—an average of perhaps a week—of so-called incubation, and often begins suddenly. Probably a certain amount of

the poison must be introduced to cause fever, or some especial susceptibility must exist to make possible the cycle of events referred to. The theory seems plausible that the self-limitation of these diseases is due to the rapid accumulation in the body of the products of the microbes, first depressing, then destroying them; or that the microbes, by some reaction of the physiologic forces of the system, provoke the formation of a toxin capable of destroying them in a few days. This class of diseases includes, of course, typhoid, typhus, scarlet, and yellow fever, measles, German measles, whooping-cough, vari-cella, variola and its modifications, pneumonia, plague, diphtheria, erysipelas, follicular tonsillitis, possibly acute rheumatism, and unnumbered other and yet unknown diseases. The list is not complete, nor will it be probably for many decades to come. We shall go on, as we have done, discovering new diseases out of the symptoms that have been the common but misinterpreted observation of centuries.

5. We know that high temperature results from certain conditions of malarial organisms in the blood, the forms of fever differing with the life-history of the plasmodia. Here, too, personal susceptibility plays some part in the process; all people do not resist or succumb alike, nor do all who are affected suffer alike, either in manner or degree.

6. High temperature of the environing atmosphere, with or without the sun's rays, under certain conditions causes alarming pyrexia known as thermic fever or sun-stroke. It is probably due to inhibition or stimulation of some of the heat centers or other part of the heat-regulating machinery. But microbes have even been accused of inducing these cases, and it is not very unlikely that toxins are produced in the tissues by the heat and disturb the regulating centers, and so cause fever as the toxins of bacteria do.

7. We know that inflamed follicles of the tonsils may cause sudden high temperature, lasting a few days and subsiding spontaneously, while the same sorts of microbes are found within them that are discovered in normal follicles. How far this fever should be attributed to pus poison is unsettled.

8. Inflammations in general are attended with fever. Formerly we thought they always produced the fever; but now we know the two events are frequently co-results of some other causative influence. Where some irritant, applied locally, depreciates the vitality of a part, and inflammation results, and then fever, it is rational to assume that the microbes of pus may find there a culture-medium, and infect the system as they do from an abscess. But when, as in the pneumococcus infection, we know a fever precedes the inflammation in the lung, it is clear that the microbe poison in the blood does the whole mischief. And nobody knows how much of some toxin may find its way into the circulation as the result of an inflammation and help to cause fever.

9. We know, but usually forget, that the commonest serious diseases of the kidneys are free from fever as well as from backache; that practically no disease of these organs causes fever save the rarest and somewhat questionable acute parenchymatous inflammation of the renal or the perirenal tissues, and that in general only those with calculi cause pain in the back. Bright's disease fails to do either in any of its multifarious forms.

10. We do not know how much fever is caused by tuberculosis apart from that due to pus microbes encouraged to grow by the tissue necrosis, which is nearly always induced by this remarkable disease, and to absorption of products of the necrosed tissue itself. Pure

tuberculosis may, but usually does not, cause fever under circumstances that permit us positively to exclude the presence of pus products or those of inflammation or necrosis, whatever they are, except where the tissues of or about the central nervous system are directly involved.

11. We do not know why fever rises or falls rapidly or slowly. There are ingenious theories about it, but no proof.

12. We lack positive information to explain the genesis of many cases of fever which occur suddenly in children—and occasionally in adults—and are connected in some way with gastro-intestinal derangement. The difficulty is that at times apparently exactly similar disturbances are unattended by fever. An easy claim is that ptomaines from decomposition of intestinal contents cause them. It may be that a part of the cases are so caused, but as to many of them it is unproved and appears unlikely. The symptoms of constipation and diarrhea, of pain and swelling, are, so far as any clinician can tell, exactly the same a hundred times—an even many times in the same patient—when no fever occurs. It is easy to say that the fever must be due to some peculiar chemical or vital change not present in the other cases; and it is true that if abnormal metabolism within the digestive organs or elsewhere can cast into the circulation such substances as pepsin, peptones, albumose, fibrin ferment, or diastase, fever is produced. That such events do occur in these cases is largely conjectural.

13. We may fairly be in doubt to what degree nervous perturbation alone can cause fever. In a pus-poisoned patient, or one with an essential fever or tuberculosis, where there is even a trifling elevation of temperature, this is often made worse by mental excitement or by work. Can the excitement alone produce it when no poisoning exists? Probably not, since the greatest mental excitement—grief, fear, joy, anger—in a well person usually causes nothing of the sort. And in the cases where the fever is produced or raised by activity, is this due to the nervous excitement or to physical labor? A patient with tuberculosis or pus absorption, who keeps perfectly quiet in body and mind, may have a maximum temperature of perhaps 100 F. some time in the day; but a walk round the block or a business discussion of half an hour will carry it to 101 or 102. This is so well known that in sanatoria for consumption the rule is general that only patients wholly free from fever are permitted to exercise.

It seems impossible to deny that psycho-neuroses may disturb the heat-regulating machinery and produce positive fever. But the apparently fabulous fever reported of certain cases of hysteria is subject to honest doubt. Many physicians even deny that pure hysteria can cause fever. But the pronounced paralysis of motion and sensation, the spasms of several kinds, the hyperesthesias, and the erratic aberration of functions of almost every sort and degree, known the world-over as the result of hysteria, ought to make it easy to believe that the heat-centers may be involved as well. And if hysteria can affect them, then there is no limit to their possible degree of aberration, except the capacity of the tissues to produce and husband heat, and their tolerance of high temperature without coagulation.

14. There are numerous slight attacks of fever that seem inexplicable. They are short, and have few or no focal symptoms or signs, and no evidence of microbic poisoning save in the mere phenomenon of fever. That this fact is some evidence can not be denied. But if the reasoning is sound, then it is fair to assume that hitherto unknown microbes—or their life-history—capable of producing definite febrile action are yet to be discovered.

Time was when *rôtheln* was some erratic form of measles; now we know it to be a specific and probably microbic disease, differing wholly from the latter, and protecting its victim as measles does. Time was when *myxedema* was a freaky form of dropsy; now we have its perfect explanation—with what glory to modern pathology every one knows; and cretinism is analogous to it. Why should we not expect to find that other specific diseases have been occurring under our eyes and observation for years without our knowing it? And why should we, every time we are confronted with one of these inexplicable fevers, attempt to make it fit some of the grooves of known febrile disorders, as typhoid or malaria, or be unhappy if we can not? The effort to do this leads us often to hazard a diagnosis that, being false, we are forced to change in a few hours, or that we foolishly feel compelled to stick to throughout the case, to our discomfort and loss of self-respect. And we gain little, save with a peculiar portion of the public, when we load our uncertainties off upon some convenient scapegoat, the existence of which can neither be proved nor disproved. Formerly the scapegoat was malaria; now that malaria is so perfectly demonstrable, it is oftener grip—that can not be demonstrated; for the necessities of a scapegoat require that it shall be airy, indefinite, and incapable of proof.

During this very season numerous cases have occurred in many states, of suddenly oncoming fever, lasting two or three days, with slightly swollen, red pharynx, and no apparent follicular inflammation. The general malaise, weakness, and perhaps headache of the fever state have come and vanished in this brief period. Perhaps these cases were the true influenza; perhaps some other zymotic disease as yet unidentified.

The clinical significance of fever depends on other circumstances than the fever itself. High temperature, *per se*, is of small account. With a spot of sharp abdominal tenderness or rigidity of muscles, or with unconsciousness or spasm, coming on with fever, it may mean very much, as may a long-continued slight elevation of temperature without focal symptoms. This last leads us, especially in chronic cases with slight indisposition, to hunt long and faithfully for the cause. Clinically it is a valuable pointer.

The temptation among practitioners to treat the fever state is almost irresistible, but it should not ordinarily be treated. The wholesale medication so often used for this purpose is mischievous in the extreme.

If unconsciousness or convulsions attend high fever, showing brain involvement and perhaps a paralysis of some of the heat regulators, the temperature should be promptly reduced by baths, for through this act directly, or by some increased elimination it produces, the convulsions usually cease and consciousness returns. It is not true that fever of moderate degree must be brought down at once; fever often endures for a long time with little harm, as is shown in many cases of tuberculosis of the lungs, in which a slight daily elevation of temperature may persist for months with little impairment of the strength or general physical condition. Slight fevers may occur daily with no cachexia for a long time; the system becomes adjusted to it and the secreting organs are little disturbed.

A very high fever, or one that produces marked head discomfort, or great restlessness, may not improperly be reduced by means of coal-tar preparations or the application of water. But it is not proved that in typhoid or other fevers the antipyretic drugs for any ordinary febrile temperature have shortened the attacks or in-

creased the percentage of recoveries, and the habit of using them for this purpose has undoubtedly done much harm and very little good.

Probably the drug most extensively used for lowering fevers during the last thirty years—notwithstanding the free prescribing of the coal-tar preparations—is aconite; yet to this hour I am ignorant of any proof whatever that this drug can lower the temperature of fever, except by injuriously lowering the vitality of the patient. It may slow the heat and lessen nervous perturbation; but that is quite another thing.

We often find ourselves considering in the most serious manner as a grave thing the direct effect of a temperature of, say 102 F., and lasting for a few hours or for a day. And we have connived at the belief by the lay people that such a fever is dangerous. If placebos are needful for the *morale* of the patient, there is no objection to giving some innocuous thing ostensibly for the fever, but for doctors to regard it as necessary on other grounds is unscientific and poor practice. A free catharsis at the beginning of sudden fever often gives a sense of relief, probably by removing ptomaines and other effete matter from the intestines, and in this or some other way removing congestion—or a sense of it—from the head. But except by removing ptomaines there is small proof that it lowers the temperature; and evidence of this latter even is not of the best.

It is, of course, always in order to attempt to remove or destroy the causes of fever. Some of the more tangible ones, especially those of a surgical character, we may deal with effectively. We may evacuate effete matter from the alimentary canal and increase the toxicity of the urine, which it seems clear is one of the eliminative effects of the Brand treatment of typhoid, although many forms of treatment may help the system to free itself from the toxic influence.

The service of this sort which we can render is very sharply limited, and may be roughly indicated as follows:

1. Pus-pockets, suppurating surfaces, and cysts leaking into the connective tissue, and so reaching the general circulation, may sometimes be evacuated or removed.
2. Inflammation may be assuaged, cured, or waited for.
3. Ptomaines in the alimentary canal may be evacuated by a cathartic if they do not directly bring on a remedial diarrhea.
4. Malarial plasmodia may be effectively dealt with; and we have, fortunately, one drug proved to have a positive action against these parasites.
5. The causes of the essential fevers, that obviously consist of specific microbes which run their course in definite periods, are usually destroyed by the conservative havoc wrought by the products of the microbes themselves. No drug is capable of destroying them, and, on the basis of present knowledge, it is idle to medicate by such means. But we are beginning to know that the destruction of these poisons is possible by artificial means acting like the physiologic forces. The success already attained in a few diseases, most notably diphtheria, is crucial proof of the possibilities in this direction, and is reason for the faith that we shall soon be able to deal with many diseases in the same way. This is the direction the efforts of every clinician ought to take, and we await the beck of the votaries of bacteriology and pathology.

It is hard to keep the practising part of the medical profession plumb, as it is the lay world. We easily drop into habits of prescribing for insignificant things, to the

neglect of the few indications that make for the patient's better comfort and greater prospect of recovery—the two objects that alone justify the existence of doctors. We give aconite or other drugs for slight fever and to bring down the pulse; digitalis, because the pulse is weak at the wrist—even when the weakness is apparent and not real, but due to the muscular and nerve fibers of the vessel-walls; we give calomel to clean off the tongue; prescribe for dry and rough skin and for cold, clammy skin; and for temporary dark coloration of the urine—and all as though such things were consequential and not the necessary, harmless accompaniments of many sicknesses of all shades of severity. Worse, we often prescribe thus to the injury rather than the benefit of the patient, and by pursuing such methods hide from our own eyes the manner of reasoning that means growth and the measures that, beside being scientific, are genuinely useful for the health and longevity of the sick.

SURGERY OF THE TEAR-PASSAGES.*

J. G. HUIZINGA, M.D.

Professor of Ophthalmology, Chicago Post-Graduate Medical College.
CHICAGO.

What the physician of to-day wants more than anything else is a practical knowledge of the science and art of medicine as it is practiced by the leading men in the various departments into which the work is ordinarily divided. Theorists there always have been and always will be, and they undoubtedly serve a very useful purpose; but to the ordinary physician he is an unknown quantity. His logic and theoretical deductions may be interesting, even fascinating, but directly they are of extremely limited practical benefit, to either the physician or the patient.

With the exception of a very few, the members of this society are all general practitioners; or let me put it a little differently—they are general specialists, i. e., specialists in everything. In your every-day practice you are called upon to examine into and treat every form of sickness or accident that our bodies are heir to. Isolated as some of you are, you do not always have the time or opportunity of calling in the assistance and counsel of men who by special study and large experience have become experts in the different specialties. Allow me, therefore, to speak to you this afternoon about a group of diseases that every one of you must often have met, and without theorizing as to the how and why or whence, give a brief summary concerning their general diagnosis, care and treatment, together with a few hints as to the dangers to be avoided.

Among the most numerous and most important diseases that the oculist is called upon to treat are the diseases of the canal whose function it is to conduct the tears from the lachrymal lake into the nose. The epiphora which usually accompanies these diseases is so annoying and aggravating that persons suffering from it very soon seek medical advice. The tears, instead of finding their way through the passage ordained by Nature for them, are either prevented from entering the canal at all, or having entered, are hindered from passing through it. In either case it results in the tears flowing over the border of the lower lid on to the cheek. If this happens only occasionally, it will not seriously inconvenience the patient, but if it be continuous and, as is usual, aggravated by being out of doors, especially when it is windy, it will sooner or later result in consid-

*Read before the Grand River Valley Medical Association, Aug. 15, 1899.