

OUTLINES

OF

PATHOLOGICAL SEMEIOLOGY.

TRANSLATED FROM THE GERMAN

OF

PROFESSOR SCHILL.

WITH COPIOUS NOTES.

BY

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IN IRELAND, ETC. ETC.



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THE DEBT WHICH MEDICAL SCIENCE
AND MORE ESPECIALLY PRACTICAL MEDICINE

OWE TO

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JUSTLY DEMANDS THE INSCRIPTION TO HIM OF ANY WORK
CONNECTED WITH CLINICAL PATHOLOGY :

This Volume

IS THEREFORE DEDICATED TO HIM,
WITH SENTIMENTS OF PROFOUND RESPECT,
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PREFACE

BY THE TRANSLATOR.

THE improvements which have been made in every department of medical science by the labours of modern physicians, both foreign and domestic, and the precision introduced of late years into the study of clinical medicine by the distinguished physicians who have the charge of our great hospitals in this country, would offer sufficient apology, if any were wanting, for the publication of some work specially devoted to pathological semeiology. The work of Professor Schill, of which the present is a translation, appeared to combine nearly everything valuable in the writings of the ancients on the subject of semeiology with all that is useful in the improvements of the moderns. Wherever it seemed necessary, other works have been consulted, and extracts made from them, in the form of notes; more especially the voluminous work of M. Piorry, recently published on the same subject, has been laid under contribution, and many useful remarks taken from it and added to the work. Until within the

last twenty-five or thirty years, this branch of medicine was but very imperfectly cultivated—a circumstance which may be referred to the prejudices of the times. The only bases on which it was made to rest, were physiology and clinical observation; and though such bases might no doubt suffice in many cases for all that concerns prognosis, they were totally inadequate for establishing anything like a perfect diagnosis, which can only be done by comparing the phenomena observed during life with the lesions found on the dead body. Thus the ancients, to whom such modes of investigation were peremptorily prohibited by ignorance and prejudice, were left far behind the moderns in the knowledge of diagnostic signs. It is sometimes said, even at the present day, that the disturbance of a function indicates lesion of the organ which presides over that function; the falsity of such an assertion is, however, every day proved by the investigations of pathological anatomy; and were it necessary, we could multiply instances of the gross and ridiculous, if not too often fatal, blunders arising from the practical application of this delusive principle, more especially in the case of thoracic disease.

Whether we take a rapid glance over the entire extent of nature, or confine ourselves to the contemplation of some of its productions, everything will satisfy us as to the truth of this fundamental principle—that there exist constant relations and necessary con-

nexions between the internal qualities of things and their external character. The same principle holds good in medicine. A similar dependence is found to exist between the symptoms and the intimate nature of diseases; with this difference, however, that it is not here a mere dependence of fitness or congruity, but a dependence of effect on cause.

Thus the symptoms, when duly and sufficiently considered, cannot fail to point out the disease to us and such of its general properties as it is most important for us to know—that is, the causes with which it is most closely connected, the amount of the danger or hope which it may present, and the treatment which should be adopted for its removal.

The knowledge of the symptoms is, then, that which we acquire first in the knowledge of diseases, and which the senses present to us. By connecting and comparing these symptoms, and above all, by subjecting them by the rules of analogy to our previously acquired notions of the general course of diseases, of their characters, their termination, &c., we deduce from all these combined data consequences and conclusions which are precisely what have been called signs.

These conclusions are referrible, 1st, to the knowledge of the disease or of its nature—these are the *diagnostic* signs; 2nd, to the knowledge of the probable results—these are the *prognostic* signs.

It is only by the process of analysis we are enabled to arrive at these different results. In the first place, in the group of the collected symptoms we must separate those which are merely accidental from those which are essential to the disease. We must also leave out of view those general or common symptoms which occur in almost all diseases, and which therefore do not belong to any one in particular. It is evident that for this first operation it is necessary to have a profound knowledge of the character of diseases, as well as of their general history; thus the study of general pathology and of nosology must precede any attempt at clinical practice, more particularly it must precede the study of semeiology; we must learn to know diseases by the symptoms which are peculiar to them, in order that we may at length be enabled to predict their termination by that which we know of the diseases themselves.

When by this process there remain in the table of symptoms those only which belong to the disease, our next endeavour should be to combine those which may lead us to suspect or discover the true seat of the lesion; having taken this first step, we have already made a considerable advance in the diagnosis, as we have determined the general name of the disease.

We must then seek in the collection of the symptoms the essential cause of the disease; that which constitutes its nature and determines the treatment.

It is the manner of performing this operation which constitutes true medical tact.

Our next business must be to seek in the combination of the symptoms whether the disease be simple or complex; if complex, to determine the nature of the complication, to judge of its importance, and to decide how far the treatment should be influenced by such complication.

Lastly, by combining and comparing the symptoms, by appreciating their relative and absolute severity, by considering their nature, duration, correspondence, &c., we shall be able to ascertain the probable issue of the disease.

The isolated symptoms which constitute a disease, such as these symptoms present themselves to the senses, may be well compared to the letters of the alphabet placed before the eyes of a man who sees them without combining them; so far they have no value nor import. But when they are put together, when the vowels are combined with the consonants so as to form syllables, when these again are joined so as to constitute words, the whole being combined forms phrases and sentences. It is precisely the same with the symptoms; it is only by combining them in different ways that we succeed in deducing from them signs calculated to discover to us the nature of the disease, the dangers with which it is connected, and the hopes which we may entertain of its termination.

The chief, the most important, as well as the most difficult task of the physician consists in discovering with promptness and certainty the nature and value of those signs. This science is the result of the analytical process which the symptoms are made to undergo.

As considerable confusion is occasionally found to occur in medical writings, as also in medical reasoning, by the careless and inaccurate use of the terms *sign* and *symptom*, we may here observe that in medicine every thing is called a *sign* which can throw light on the past, present, and future state of a disease. Those signs are called *commemorative* or *anamnetic* which make us acquainted with the previous history of the disease; those which throw light on the present state of the disease are called *diagnostic signs*; whilst those which announce the changes which will supervene in the ulterior progress of the disease are called *prognostic signs*. Though the progress of the disease, its intensity, and the causes which have given rise to it, may present to the physician signs more or less valuable, still it is the symptoms which afford the most numerous and most important signs. By *symptom*, in medical language, is understood any effect or change which is observed to occur in the living body—an effect which deviates more or less from the natural state, and which is perceptible to the senses of the physician or patient. The symptom is intimately connected with the disease;

it necessarily follows it, as Galen says, in the same way as the shadow follows the body. But it is only medical tact, the result of close observation and well-instructed experience, that can convert this symptom into a sign. We may readily see that the symptoms are perceptible to the senses of a mere common observer; but the perceptions of the senses would be totally insufficient and almost useless for the study of diseases, if the intellectual faculties remained inactive, when the senses were struck by the symptoms. The mere application of the senses suffices to become acquainted with the symptoms, but the knowledge of the signs is the result of thought and reason directed towards these same symptoms. It is in this just appreciation of the symptoms, from which positive notions of the signs are deduced, that medical skill really resides. In fact, the symptoms are within the reach of every one; but the physician alone knows how to discover, in their examination, the nature and value of the signs.

Galen relates an anecdote which clearly shews the distinction between sign and symptom; he states that being at one time dangerously ill, and having overheard two friends of his who were with him discourse of certain symptoms which they had just observed on him, such as redness of the face, an injected, haggard, and inflamed appearance, &c., he cried out to them to adopt every necessary measure forthwith, as he was threatened with delirium. Here the two friends saw

the symptoms well enough; but it was only Galen himself, who, though the patient, was able to deduce the sign of delirium from them,—that is, to convert or translate those symptoms into signs.

The insufficiency of mere symptoms for the detection of the seat and nature of a disease may be very readily demonstrated. Let us suppose a patient to complain of pain; before we attempt any treatment for its removal, we must first determine the part of the body which is the seat of this pain. Suppose we have succeeded in determining its seat to be in the abdominal region; in order to establish an accurate diagnosis, we must examine one after another all the organs situate in this region, in order to ascertain whether the skin, the cellular tissue, the muscles, the peritoneum, or the intestines, be the seat of this pain. Let us suppose we have found the intestinal tube to be its seat; we have as yet only made an approximation to the nature of the affection; we have not at all determined it with precision. We know that pain, taken in the abstract, is but a lesion of sensibility, which sometimes supervenes primarily on some disturbance of the nervous system, and is sometimes consecutive on inflammation. Our business now is to distinguish these two cases; to decide whether we have to treat an inflammatory pain, or a purely nervous pain; to avoid, in fact, the blunder of the mere symptom-doctor, who would in such a case employ opiates or

depleting measures indiscriminately, without any reference to the real nature of the affection.

Thus it is clear that in the practice of medicine the symptoms have but a relative importance; we must, in order to derive any benefit from them, refer them to some seat, or organ, and ascertain the nature of the affection of which such organ may be the seat.

For the sake of the junior student, we shall adduce another case to prove the insufficiency of mere symptoms. Suppose we have ascertained that the disease under which a patient labours is ascites: now ascites is but a symptom; if we confine our attention exclusively to this symptom, without referring it to some organ, we form no diagnosis, we know nothing either of the seat or nature of the disease; for the effusion which we have detected is not the disease; if it were, the patient would get well as soon as such effusion were removed by paracentesis abdomini, on the old maxim, "*Sublatâ causâ tollitur effectus;*" on the contrary, it is too well known that in the great majority of cases the effusion returns after tapping. Thus, then, we must have recourse to our knowledge of general pathology, which, among other things, tells us that ascites may depend on different kinds of lesions; that it sometimes is referrible for its cause to disease of the heart, or liver, sometimes to disease of the peritoneum, to a depraved state of the blood, and according to the valuable researches of Dr. Bright, Dr. Os-

borne of Dublin, and Dr. Christison of Edinburgh, to disease of the kidneys. Thus, then, when we see an effusion into the peritoneal sac, we must proceed to examine with attention all these organs, in order that we may be able to determine which of them it is to which we are to refer the symptoms in question,—that is, in order to form a correct and practically useful diagnosis. Formerly, when the removal of the water constituted the principal indication, serous effusion was considered to be the disease, and medicines called hydragogue* were the exclusive means indiscriminately employed by the practitioner. At present, however, our hydragogue remedies vary according to the nature and seat of the affection; sometimes venæ-section and leeches to the abdomen are found to be the best hydragogues; at other times our attention and treatment must be directed to the heart; whilst on many occasions, nourishing diet, baths, preparations of steel, &c., are found to be the most effectual hydragogues.

We once remember the case of a patient who presented a group of symptoms, such as dyspnœa, violent cough, copious expectoration, great exhaustion and emaciation, together with night sweats, which his medical attendant decidedly pronounced to indicate phthisis; the patient was directed to give up his business

* ὕδωρ, water, ἀγω, to bring or draw off.

and retire to the south of France. This occurred just at the time when the stethoscope was beginning to gain some ground in this country, in spite of powerful and virulent opposition from those practitioners who were either too lazy, too stupid, or too old, to submit to the labour of studying it. The patient was submitted to a stethoscopic examination; we detected absolute dulness of sound on percussion on the right side over the lower part of the right lung, both anteriorly and posteriorly, with distinct puerile respiration in the upper part of the same lung, commencing dulness on the left side, &c. Here our diagnosis was hepatization of the lower portion of the right lung, and that the case was originally a simple pneumonia, which, because some relative of the patient had died of phthisis, the family physician took for granted, without further examination, to be a similar affection. By the adoption of the proper means, the patient was restored to health and his family; though it is evident that had he gone on much longer, he would have fallen a victim to the disease, and to the ignorance of his symptomatic attendant, whose diagnostic powers would have gained still further credit from the very fact which should have forever damned him as a practitioner.

In thus condemning the exclusive attention to mere symptoms, so pertinaciously acted on by some of the physicians of the old school, we would not be understood to intend this censure for those who are still

found fondly devoted to the study of the ancient medical writers. We are free to confess that from the writings of Hippocrates, Aretæus, and others of the Greek physicians, much useful information may be derived on the subject of semeiology. The facts to be found recorded in their writings must always be valuable, independently of the theories by which they may have endeavoured to explain them. We fear that the study of these writers has been too much neglected, and so fully impressed are we with the conviction of their great value, that we would address to junior medical students the lines of Horæe :—

Vos exemplaria Græca,
Nocturnâ versate manu, versate diurnâ.

We feel we have somewhat exceeded the limits of an ordinary preface ; but the importance of attending to the signs of disease, and of carrying our views beyond the mere symptoms, seemed to require it. We shall now conclude in the words of one of the oldest writers on semeiology, Fernel : “ Tanta est signorum necessitas, ut, his sublatis, fundamenta medicinæ corruant.”

INTRODUCTION.

Definition of Semeiology.

1. SEMEIOLOGY constitutes the doctrine of the relations in which the phenomena in the human system stand with respect to the vital state which causes them. According as the latter is normal or diseased, semeiology is divided into the physiological and pathological. Pathological semeiology considers the phenomena, whether normal or abnormal, according to their relations to the states of disease which have produced them; it includes in the circle of its inquiries those changes which the functions present, as well as all changes of the organs, as far as they stand open to observation in the living being.

It here seeks to illustrate the origin of the phenomena, and infers from them the present state of the disease, its early course, and future progress; it confines itself either to the individual phenomena alone, or compares them with others, which are capable of giving to the latter a determinate commemorative signification with respect to diagnosis or prognosis.

Sources.

2. Observation is the source of semeiology. This must include both the phenomena which present themselves during life, and also the changes of the organs as they are to be seen after death. In order to be available to science, it must be accurate and perfect. To accuracy of observation appertain practice of the senses, an acquaintance with the terms of art, full attention to the subject, freedom from preconceived opinions,

and a willingness to speak the truth. Accurate observation may be characterized by connexion of the collective phenomena, their correspondence with previous similar observations, and by its not being established for the purpose of supporting an hypothesis. The admission of extraordinary marvellous cases into science is best avoided, until further observations have confirmed them, or have discovered the connecting links between them and that which is already known. If such cases have come from persons who have already found several similar wonders, we must be doubly cautious.

In order to attain perfection in observation, it is deemed necessary that all the organs and functions should be interrogated, as far as our means allow it; that whatever is found abnormal should be strictly investigated; the preceding and accompanying external influences should be carefully taken into account, and the earlier physiological and pathological phenomena be thoroughly known.

Such observations only can serve as materials for pathological semeiology; accordingly, a judicious selection of the literary sources becomes necessary. It is in the writings of an Hippocrates, Aretæus, Baglivi, Sydenham, Hoffmann, Ramazzini, Morgagni, Stoll, Frank, Hildenbrand, Vogel, Laennec, Andral, Louis, Abercrombie, Bright, &c., one may expect to find the most authentic sources for semeiotal investigations. At the same time, the results of one's own observation should not be admitted into the circle of those truths which have received the confirmation of centuries till after the most careful examination.

Formation of Signs.

3. Observations obtained in this way are now considered in semeiology according to their various directions. This science seeks to become acquainted with the cause of the individual phenomena by inquiring with what various groups of the same they happen to be combined. It first argues from these to the changes of the internal organs, and then from both the anatomico-pathological and the pathological phenomena to the cause which occasions them. If this is accomplished for every combination of phenomena amidst which a single phenomenon may occur, the cause of the same may be established. Where science has not yet been able to determine the species of changed vital function, it must content itself with denoting the groups of symptoms amidst which a phenomenon shews itself,

or the change in the organs which the disturbance of function accompanies.

4. The diagnostic import of the individual phenomena,—that is, their value for the knowledge of the present state of disease,—proceeds from the more or less close connexion in which they stand with the determinate species of disease, and with the seat of disease. Here the rule holds good, that if phenomena which are connected with a disease in a constant or almost constant manner stand in close relation to it, they may now be explicable or not on physiological and pathological laws. In the latter case, one should be particularly careful in the formation of signs, and repeated accurate observation is required. The greater or less diagnostic value one may determine by inquiring, on the one hand, with what multifarious states of an organ a phenomenon is connected, and how great the number of affections of other organs is, which, in the organ more immediately exhibiting the phenomenon, produce the morbid state necessary thereto. On the other hand, it will appear from this how different the other phenomena of this state are from each other. The fewer phenomena we are obliged to connect together, in order to give each their diagnostic value, the greater the latter is.

5. In order to obtain for the phenomena an anamnestic or commemorative import, it is to be ascertained whether, in case they are gone by, they hold any relation to the present state. If the phenomena to be estimated are present, their commemorative value is determined by examining whether, in connexion with other phenomena, and according to the greater or less strength of this connexion, they point to a by-gone disease or cause, and presuppose this.

6. The prognostic value of a phenomenon is determined by the importance of the organ the morbid state of which it indicates; the extent and species of the organic change, in case such be present; the degree of functional interruption which it occasions; and lastly, by the species of morbid process.

7. Semeiology, by using its materials in this way, and by giving to the phenomena a diagnostic, commemorative, and prognostic signification, forms signs from them. By phenomenon is meant, every change of the organism tending to disease, or even within the boundaries of health, perceptible by the senses of the person observing, or the feelings of the individual observed. The idea of symptom refers to that which is per-

ceptible in the diseased organs and functions. From the phenomena and symptoms arise signs, when they stand related to a present, past, or future morbid state, so that they are connected according to physiological or pathological laws, or even according to mere experience, with a determinate species, course, and seat of a morbid process. The discovery of the phenomena is the business of the senses; the formation of signs is the business of the judgment supported by experience, and requires nosological knowledge. This operation has been justly considered as the most difficult, and at the same time the most important, in medicine.

Relation to the other Pathological Sciences.

8. The end which pathological semeiology has in the consideration of morbid phenomena—namely, to form signs—distinguishes this from the other branches of pathology. There are two ways according to which pathology considers disease: the first proceeds from without, from the phenomena, and seeks from them to investigate the seat and existence of diseases; the second proceeds from within, from the existence of disease, and shews how it expresses itself externally in the phenomena. To the first series of pathological sciences belongs semeiology. The basis of this science is, phenomenology and symptomatology. Phenomenology investigates what varieties present themselves in the phenomena of the organs and functions, without attending to their relations, to the causes, &c. Symptomatology, having to do with such changes as have reference to disease, and with a perfect enumeration of these, aims at connecting them with their causes. This branch is preparatory to semeiology, a branch which directs its attention immediately to them, estimating the individual phenomena alone, or in connexion with others, according to the cause and relation to the present, past, and future state. The clinical branch of medicine goes a step further; it directs its attention, not to individual phenomena and their indication in connexion with a few others, but it seizes on the entire series of phenomena, as they present themselves in a picture of disease; and by considering the individual phenomena and their connexions, according to the principles of semeiology, it attains the knowledge of the seat and form of disease, of its early course, of its present state, and of its future progress. Justly, therefore, has semeiology been called the introduction to clinical medicine.

9. Between both there is a chasm which consists in this,—that semeiology subjects the individual case in connexion with a few others to its investigations, whilst clinical medicine has to do with extended pictures of disease. The more semeiology widens the circle, and, amid the individual phenomena, the more of the accompanying phenomena it takes into account, the nearer it comes to clinical medicine. But the remaining interval might be best filled up by the introduction of a new branch of pathology, the object of which should be to set down general groups of symptoms applicable to several species of disease; and from these, by the addition of other symptoms, which may serve to distinguish the special cases, to infer the seat, form, as also the past, present, and future state, of the disease.

10. The second series of pathological sciences recognises disease, the changed vital state, as the point from which it starts. If science investigates this in itself and its varieties, it is called general nosology; if, setting out from the various modifications of morbid life, it ascends to the internal and external causes which give rise to them, it is engaged in special ætiology; if it proceed from the causes to the change in the vital state, it becomes general ætiology. On the other hand, in special nosology, it observes how the disease expresses itself in its appearance. Diagnosis and prognosis, according to the way in which they have been hitherto practised, are branches of special nosology; the one devotes its attention to the subject of the external appearance of disease, which contributes most to a knowledge of it, whilst the second confines its attention to that which throws most light on its future progress.

Value of Semeiology.

11. The place which semeiology occupies in the circle of the pathological sciences already displays its great value. It rests upon experience, and strives to ascend to a knowledge of the essence. It exalts mere experience to science; gives unity and import to that which has been acquired through the senses; it creates a firm basis for theory, secures it from errors, and comes to solve its problems in a slow but certain manner. Semeiology is that part of medicine which first attained a certain degree of perfection, so that the other branches might then be erected on the foundation of its acquisitions. For the medicinal development of the individual it is as indispensable as it was for the development of the science. As a foundation of clinical medicine, its study should precede this branch. Not until prepared through it does a person become enabled,

amid the individual groups of symptoms, to discover the seat and form of the disease, its early course, future progress, and present state, with all that clearness and accuracy of which the individual case is capable.

History of Semeiology.

12. The history of semeiology may be divided into four periods; the first comprehends the time of the Asclepiades, the second extends from this down to the general revival of the sciences, when the study of the ancients, and observation, again came into vogue.* The fourth commences with the time when pathological anatomy obtained influence over pathology in general, and also over semeiology.

13. Materials for the first works on semeiology,—namely, those of Hippocrates, were afforded by the custom which the Greeks followed, of suspending votive tablets in the temples, which contained a short description of the disease. The Hippocratic school used these descriptions in order to lay down a number of semeiotic principles; this was the origin of the *Prænotiones Coacæ*. Hippocrates, son of Heraclides, proceeded with still greater circumspection and care, and left us in his prognostics, prorrhethics, and aphorisms, a rich treasure of truths, and a pattern how one should employ the experience obtained by true observation. He had the great advantage of learning the natural course of diseases, the sick being confined in the temples, and the treatment accordingly being entirely consigned to the curative powers of nature. The direction of the Hippocratic semeiology inclined more to prognosis. Rich, however, as it is in truths which the experience of two thousand years has confirmed, there are not wanting many blemishes in it, abstracting from all the falsifications of manuscripts. Many semeiological propositions are expressed too generally; many of the diagnostic propositions are not adapted to the thing indicated, and where they are adapted, the accompanying signs are frequently omitted, from its connexion with which alone a phenomenon derives such import.

14. In the second period of the history of semeiology, the doctrine of signs made but little progress, as compared with the first period. Unfortunately, we possess no writings of the empirics from which, according to the principles of this school, one would expect that the science of semeiology should

* The *third* period may be dated from the revival of the sciences to the commencement of the nineteenth century.—*Tr.*

be most enriched. The doctrine of the methodists was too much opposed to the spirit of semeiological investigation to allow semeiology to make much progress. Cœlius Aurelianus was the only person who did any thing in it, by laying down the distinction between critical and symptomatic phenomena, and by pointing out the signs of many diseases. The pneumatists cultivated semeiology with more ardour, but they mixed up in it a number of subtle and badly grounded views. Archigenes obtained some credit by his work on the doctrine of the pulse, of the phenomena of respiration, and that on the distinction of pain. But Aretæus did much more service by his faithful and animated description of diseases. Among the ancients, he has advanced semeiology most after Hippocrates.

Galen, besides recommending the writings of Hippocrates, has also served the science of semeiology by his observations on critical days, his division of symptoms, and his essay on the pulse. The latter work, however, is overstocked with subtle distinctions, which have no foundation in nature. Oribasius and Aetius also have enriched semeiology by some contributions. After them, little more was done for this branch of science till the fifteenth century. The Arabians extended it merely by the signs of individual diseases found out by them. With that exception, ignorance and superstition prevailed in this half of the second period. Urinoscopy occupied the place of semeiology.

15. The third period commences with the general revival of the sciences in the fifteenth century. It was a fortunate circumstance that it was chiefly the Hippocratic writings which first engaged attention in the re-establishment of semeiology. Duretus and Heurnius commented on Hippocrates with great success, and not without gaining new ground for science; few new opinions are to be found in Holler's Commentaries. Forestus has distinguished himself by new observations; he also opposes urinoscopy. The study of the Greek writings awakened a spirit of observation; Jodocus Lommius was the first who subjected the semeiotic propositions of Hippocrates and Galen to the test of experience, and discovered a series of new signs. A directly opposite course was followed by Prosper Alpinus; in his seven books "*De præsav. vitâ et morte Ægrotantium*" he gave a very complete analysis of the prognostic knowledge of the ancients. It contains but few new observations, and is replete with repetitions, theories, and ill-grounded expositions.

The first practically useful work on semeiology was that given by Th. Fienus. It contains a considerable share of original observation, but it is at the same time disfigured by scholastic subtleties. The chemical and mechanical schools, by relinquishing the faithful observation of nature, contributed nothing to the improvement of semeiology; but the good seed which the study of the ancients had disseminated continued to fructify; and such men as Sydenham, Baglivi, and Fr. Hoffmann, in the sixteenth and seventeenth centuries, established honourable memorials in the history of semeiology.

16. The eighteenth century is distinguished for the great progress of semeiology, on the twofold ground of an illustration of the old signs and the discovery of new. Valuable expositions of the Hippocratic writings were presented in the Commentaries of H. Cope and Aubry. Among the observers who enriched semeiology most at that time, we may more particularly notice Van Swieten, de Haen, Stoll, Frank, Grant, Huxham, Jackson, Lentin, Fordyce, Gilibert, Piquer, Pringle, Quarin, Richter, Sarkone, Senac, Tissot, Werlhof, Wichmann, and Zimmermann. The writings of these men afforded rich materials for new treatises on semeiology, and accordingly manuals on the subject were constantly increasing in perfection. The best manuals of this period are, that by Leroy, of Montpellier, which, though imperfect, displays considerable critical acumen; that by Pezold, entitled, *De Prognosi in Febribus Acutis*; a similar work by Gruner, and another by Danz.

17. The commencement of the present century, though the theories and systems which have sprung up did not seem to promise much, has been distinguished by several excellent manuals, the authors of which have taken care to keep themselves free from the influence of preconceived opinions.

Landre Beauvais' work, entitled, *Semeiotique, ou, Traité des Signes des Maladies*, occupies the first place. It is distinguished as well by its fulness as by close critical acumen, perspicuity, and cautious deductions.

Sprengel's Manual of Semeiology would possess still higher value, were it not that too many ill-grounded opinions were mixed up with it. The Manuals of Behrend and of Double are distinguished for their profound study of the ancients, particularly of the writings of Hippocrates. Marshall Hall's essay, though it is much less perfect, contains some original observations.

18. These semeiological works have been enriched by the

observations of the most distinguished observers of the commencement of this century. Among the works of this period which more particularly present rich materials for semeiology, we may class those of Avenbrugger, Autenrieth, Bateman, Corvisart, Gölis, Hartmann, Hildenbrand, Hufeland, Kreyssig, Pinel, Reil, Vogel, and Willan. Of the systems which appeared in this latter part of the third period, that of Broussais has done most for semeiology, by pointing out more accurately the sympathetic relations in which the organs stand to each other.

19. The fourth period commences with the share which pathological anatomy took in ascertaining the causes of the phenomena.

Through the discoveries of pathological anatomy, which was now striving worthily to fill its proper place by the side of pathology, it became possible to ascertain the seat of many diseases; whence again arose the necessity of investigating the sympathies of organs in disease. As more accurate experience was now attained regarding the complications of disease, the physician was able to separate the phenomena in the individual cases, according to the various causes, and for every morbid state to find the symptoms peculiar to it. If, on the one hand, the number of diseases was increased, still the quantity of the signs for every individual disease was lessened, and their increase by future observation will be slow, but permanent, in consequence of the strict proofs which can be now adduced, and which can with justice be demanded. One class of diseases only, those of the lungs and heart, has been enriched with a number of new signs, through the splendid discoveries of Laennec and Avenbrugger. Lastly, if our knowledge of the origin of the several phenomena has attained a more solid basis, it is to be ascribed to the influence which pathological anatomy is beginning to exercise over general nosology.

20. The first author of this period is Morgagni, and, notwithstanding the shortness of its duration as yet, it has enriched our semeiological knowledge considerably, more particularly through the works of Laennec, Bayle, Dupuytren, Andral, Lallemand, Rostan, Cruveilhier, Piorry, Ollivier, Louis, Bouillaud, Abercrombie, Stokes, Bright, Carswell, Hope, and a number of German physicians still living.*

This new direction given to medical science, and the great

* Among these may also be mentioned the names of Elliotson, Forbes, Graves, and Latham.—*Tr.*

improvements in it, called forth new works on semeiology, among which, Rostan's Course of Clinical Medicine, and Alber's Manual of Semeiology, deserve to be more particularly distinguished.

OF SIGNS IN GENERAL.

21. The phenomena obtain different semeiological importance according to the organs and functions by which they are given, their strength, duration, form, and the relation in which they stand to the other phenomena.

22. The signs afforded by the organs themselves (the pathologico-anatomical) form the smallest number in the living body. From the external superficial organs, we obtain them through touch and inspection; from those more deeply seated, through touch and percussion. They have a great diagnostic value, because the changes in the form, size, and consistence of the organs always point out the seat of a disease. In a prognostic sense, structural change of the organs indicates obstinacy of the disease. Changes in the organs, which appear with remission of the signs of disease of other organs, are, if they appear on organs seated externally, in general favourable, whilst on internal organs they indicate local, protracted disease.

23. Signs derived from the functions form the principal subject of pathological semeiology. They have an import in pathological semeiology which varies according to the importance of the organs whose disturbance they indicate, and its relation to the other organs.

24. The signs derived from the functions of the central organs are far more important than those of the subordinate, because the central organs sympathize as well with those depending on them as also with one another. Even among the central organs, there is a diversity in this respect. The stomach, small intestine, and portal system, sympathize with more organs than the heart and lungs, brain, and spinal cord. The stomach and small intestine will accordingly disturb the functions of other organs most in their diseases, and at the same time participate in most of the diseases of other organs.

25. From this relation of the organs to one another, several important principles are afforded for judging of the phenomena observed in their functions. Should the morbid phenomena manifest themselves first in a central organ, and at a sub-

sequent period in all the organs, or in most of those depending on it, the disease of the central organ may be inferred, particularly if the sympathetic phenomena rise and fall with those of the central organ. If the morbid phenomena shew themselves in all the organs depending on a central organ, without the latter, however, evincing any disturbance of function, one must admit the seat of the disease to be in the central organ in question. If they be violent in the organs connected through a central organ, the prognosis is unfavourable.

If the morbid phenomena occur chiefly in the central organ, and less intensely in the subordinate organs, the seat of disease is in the former, and the prognosis, is more favourable.

If, together with the central organ, only one of those subordinate to it present violent morbid phenomena, the seat of the disease is to be sought in the latter, more especially if, with the increase in the violence of the phenomena in it, those of the central organ diminish. If only one central organ is affected, should the phenomena in it be of a severe character, one may infer disease of an organ sympathetically connected with it; if, on the contrary, the disturbance is not very violent, it may point out disease of the central organ.

26. The increase of the sympathetic phenomena, accompanied by decrease of those proceeding from the central organ, is a sign that the disease has in this way withdrawn to the organs subordinate to it; and if these are secreting organs, that they will terminate the entire disease; if they are not, a local chronic disease may remain behind. If violent phenomena again occur in the central organs, the prognosis is unfavourable.

Simultaneous gradual decrease of the phenomena which present themselves in the central and neighbouring organs is of favourable import, it being a proof that the entire disease is diminishing. If the signs in the subordinate organs cease suddenly, whilst those of the central organ rapidly increase, the prognosis is bad. If the signs of disease in the central organ increase rapidly with the others, we may infer increased severity in the disease.

27. Diseases of subordinate organs have a protracted course if the central organs are not involved. It is favourable if, at the height of such diseases, signs of participation of the central organs present themselves. If both are very violent immediately at the commencement, the prognosis is less favourable, as it indicates severity of disease. It is bad, if a single organ simultaneously present a great number of phenomena,

without the other organs physiologically connected with it participating therein. It has been considered as much more favourable if the signs of the disease are divided between two organs closely connected together. But if the organs which afford the signs are not connected together, the prognosis is bad, as in that case a third, which predominates over both, is the seat of the disease. Here, however, it is to be remembered, that subordinate organs may, through chronic disease, be raised to the rank of a central organ, and their disease then immediately disturbs the functions of central organs which stand in no close relation to the diseased organ.

28. The more subordinate an organ is, and the nearer it lies to the surface, the more favourable is the prognosis which its morbid phenomena yield.

If phenomena which proceed from internal organs follow signs of disease of peripheric organs, the prognosis is favourable, particularly if the former diminish in proportion as the latter gain in intensity. The prognosis is bad where, with decrease of the morbid phenomena in peripheric organs, especially where this takes place suddenly, signs of functional disturbance present themselves in an internal organ.

29. Organs of similar or physiologically connected functions sympathize in diseases, as those also which are connected by great vessels or nerves. Accordingly, in diseases of the one we shall always find phenomena present themselves in the others. In order to determine which is the diseased organ, we have to consider where the morbid phenomena are most intense, and most persevering, and preserve their form most constantly; where they first occur, and on what side the dependent organs participate in the disease, or do not.

30. Such is the mode of procedure, if organs of the same tissue present phenomena of disease simultaneously. In this case, also, one will find both diseased more frequently than only one diseased and the other sympathizing. If, then, a general morbid process is present, which expresses itself in a determinate species of tissue through the entire body, it may attack all at once, or the process follows a tedious course, and passes from one organ to the others. External influences may also attack several organs of the same tissue simultaneously. If diseases attack only a part of the expansion of a tissue in an organ, the morbid phenomena manifest themselves as well in the part affected as at the terminations of the expansion; frequently also in other parts of the organ.

31. The greater the number of organs in which manifest functional disturbances in a general disease, the worse is the case, particularly if this occur immediately at the commencement. The fewer the organs are which participate, the more obstinate will the disease be, and the earlier will it occasion structural changes.

32. According to their intensity, duration, and form, signs are distinguished into violent and slight; persevering and alternating; lastly, into those which proceed from exaltation or depression of a function, or are afforded by perversion of the same.

33. Violent phenomena lead us to conclude that the course of the disease will be rapid. If they manifest themselves in a very intense degree immediately at the onset of the disease, danger is indicated; if they increase gradually till the time of the crisis, the prognosis is rather favourable. If they have become moderate after the crisis, and then increase anew, a return of the disease is to be dreaded. If the phenomena decrease in severity after the crisis, the transition to cure is indicated; or if they continue a long time in a slight degree, the disease has passed to the chronic form. Slight, indistinctly expressed phenomena belong partly to the precursors of acute diseases, whilst they are partly signs of a chronic course and of great obstinacy. The greatest intensity of the phenomena is not always at the seat of disease, those which are sympathetic being often much more violent than those proceeding from the diseased organ itself. Great severity of the phenomena in some subordinate organs warrants us more in inferring disease of the central organ than if these phenomena had presented themselves in a slighter degree.

34. The duration of the phenomena is of importance with respect to diagnosis and prognosis. The more persevering the phenomena are, the sooner may we admit the seat of them to be in that organ which manifests them. Long duration of a phenomenon indicates great obstinacy, and warrants us in predicting continued organic changes. Alternation of the phenomena in one and the same organ indicates a rapid course. If, on the contrary, passing phenomena present themselves now in this, now in that organ, we either have to do with a morbid process which is wandering in its nature, or some central organ is the seat of the affection. If some phenomena have obstinately continued for a long time in the same form, and at length some change occurs in them, one may expect a termination of the dis-

ease. If the change is more favourable than the previous state, a hope is afforded of convalescence. The longer favourable signs continue, the better is the prognosis. Unfavourable signs lose their dangerous character in acute diseases with their long duration. Rapid changes in the phenomena depending on the actual strength of the body are bad signs.

35. Among the forms which a functional disturbance may admit, that of exaltation is the most favourable for prognosis. Phenomena which depend on exaltation of the functions indicate at the same time the simplest form of disease, a rapid course, and the participation of a limited number of organs. Diminution or cessation of a function indicates a long duration of the disease, and depends on a serious disturbance of the organ in question, or on a modification of the nervous influence proceeding from the nervous centres, or on a change in the blood. The perversion of a function, where this no longer goes on according to physiological laws, is always a sign that the nervous system has lost its normal influence over the affected organ.

36. The relation of the phenomena to each other may vary in the number, order of sequence, intensity, and form. The fewer the morbid signs are with which the individual sign is connected, the more obstinate will the disease prove. A great number of morbid phenomena in several organs indicates disease of a central organ. If all the signs are not reducible to one seat of disease, we may either expect the case to be a nervous fever, or there are several organs simultaneously diseased. If, during the presence of one group of symptoms, permanent and violent morbid phenomena arise in another organ, which throw the former into the back ground, and excite corresponding signs in the dependent or physiologically connected organs, we may admit that this organ is secondarily affected.

37. The relation of time in which the newly occurring signs stand to the signs already present is of the greatest moment in judging of the former. Violent morbid phenomena are not dangerous about the time of the crisis. If the critical precursors come before this period, and do not bring relief, they are of bad import. If the intensity of the morbid signs diminishes according to the critical movements, the prognosis is favourable; if, in acute diseases, after this diminution, new symptoms differing from the first present themselves, metastasis is to be dreaded. Diminution of the phenomena in number and intensity is a favourable sign at every period of the disease. If

at the time of the crisis several peripheric organs, or organs opening externally, give signs of increased activity, it is more favourable than if this happen only in one organs.

38. A normal relation in the intensity of the several phenomena is to be looked on as favourable. If the dynamic signs are in a direct ratio to those which the diseased organ itself yields, we may look on this as a confirmation of the diagnosis, and as of favourable import. If the signs afforded by the diseased organ outweigh in intensity those of reaction on the part of the central organ, we may apprehend a tedious course, and the continuance of organic changes. If the phenomena on the side of the sympathetically affected organs are more severe than the disease would warrant us to expect, this is a reason why the diagnosis should be established with particular caution; in such a case it may be that a more important organ is the proper seat of disease, or a secondary disease may form, or lastly, the primary disease takes on a nervous character.

39. A concordance of the phenomena with respect to form is of great importance with regard to prognosis. Favourable phenomena yield a good prognosis only when they harmonize. A single bad sign in the midst of a series of favourable signs makes the prognosis unfavourable. Perversion of a function, with signs of exaltation of the same, is bad; still more if to the signs of passiveness be joined those of perversion. If, on the contrary, during signs of diminished activity, some increase of the same is observed in all the organs attacked, we may hope for a favourable issue. But if this increase does not follow uniformly in all the affected organs, but whilst the activity of one organ is increased that of another diminishes, we are not yet to expect the termination of the disease. If the activity of the peripheric organs, especially secreting organs, increases, and that of the central organs be depressed below what is natural, the disease is to be considered dangerous. If the relation is reversed, the disease is still at the commencement, in the stage of crudity. In case of a favourable issue, the activity of the peripheric organs should increase, and that of the central organs should approximate gradually to the normal state. A contradiction in the signs of the central organs is bad, particularly between the signs of the vascular and nervous systems. Want of harmony in the signs of several parts of the body is of bad import.

Division of Signs.

40. Semeiology divides the signs of diseases according to the varieties which it observes in them when subjected to semeiological examination. All other distinctions which lie without the circle of semeiological consideration belong not to this department. We will accordingly deduce the grounds of our division from the sources and aggregate of the phenomena, then from their reference to the cause, their diagnostic, prognostic, and commemorative import.

41. According to the object which presents the phenomenon, we shall divide the signs into those from the organs (pathologico-anatomical) and those from the functions, (pathological.) Those are of the greatest importance with respect to diagnosis and prognosis. The division into constitutional and local signs also comes in here. Lastly, the phenomena may be normal or abnormal; if they have reference to disease, they belong to pathological semeiology.

42. According to the manner in which the signs are obtained, they may be divided into objective and subjective; the former are further divided into natural and artificial. The objective signs are more certain than the subjective; in the latter, we have always to inquire whether the patient does not simulate, exaggerate, or impose even on himself; they give us, however, a series of very important signs,—as pain, for example. Among the objective signs, the natural are the most certain; the artificial, wherein a medium of examination is applied, require for their credibility a correct application of the same.

43. In reference to the cause, the signs of disease vary in many respects; according as they are explicable or not, they are divided into explicable and inexplicable. According to the way in which the origin of the signs can be explained, they are distinguished into idiopathic and sympathetic; the former may be primary or secondary; the sympathetic may be antagonistic, or of the same form as those of the affected organ.

According as a symptom stands nearest in the causal connexion with another, or with the cause of the disease, or with the latter itself, we distinguish the *symptoma causæ*, *symptoma morbi*, and *symptoma symptomatis*.

Lastly, the phenomena are divided into those which may be explained mechanically, into such as may be explained chemically, and those which may be explained vitally.

44. With respect to diagnosis, a two-fold distinction is to

be made—viz., how far a phenomenon points out the seat, and secondly the process, of disease.

The seat of a disease, wherein it is left as yet undetermined of what species it is, is indicated by all those signs which depend on serious functional disturbance, on an anatomical change, or on an abnormal state of the chemical composition. To these signs, which we might call topognomonic, those stand opposed which present themselves as well in diseases of the organ exhibiting them as also in those of others, or only in the latter. Phenomena which mark a particular species of disease are called pathognomonic, in opposition to the general signs which indicate the kind of disease, and in opposition to the accidental signs which characterize neither the species nor genus of the disease, but belong mostly to the individual instances of disease. The pathognomonic signs, that is, those which by themselves alone stamp a determinate disease, are very few, those being more numerous which are capable of doing so in connexion with another phenomenon. The great majority of phenomena, on the contrary, can be raised to diagnostic signs only by being placed in juxta-position with a series of others.

45. The commemorative signs are either causes or phenomena; these latter may be either past or present. Present objective phenomena are the surest commemorative signs.

Past phenomena and external influences can be raised to commemorative signs only when their earlier existence can be clearly shewn, and they are nearly related to the present state.

46. According to their prognostic value, the signs are divided into favourable, unfavourable, and those which throw no light on the event, to which those also belong which speak for the continuance of the disease. Among the favourable signs we also reckon the critical. Of the favourable and unfavourable signs, many degrees may be admitted. As in the case of diagnosis, one phenomenon seldom attains prognostic import by itself alone, but the majority of phenomena become converted into prognostic signs only through their connexion with others.

Accordingly, in a prognostic point of view, there might be a still further division into signs absolutely bad, absolutely good, relatively bad, relatively good, and those which contribute nothing to prognosis.

SPECIAL PART.

I.

SIGNS FROM THE NERVOUS SYSTEM.

Signs from the Mental Functions.

47. ALL or only separate faculties of the mind may be disturbed. The disturbance may consist in exaltation of the cerebral functions, in depression of them, even to their total suspension, and in their perversion. They are best divided into those of the lower faculties (the perceptive faculty, and memory,) and those of the higher class.

Signs from the Perceptive Faculty.

48. The perceptive faculty is increased by animal magnetism, and in hysteria; diminished (except in diseases of the senses themselves) in inflammation, softening or hardening of the brain; in pressure on it from extravasated blood, abscesses, tubercles, tumours of the cerebral membranes, and of the cranium. Diminution of the perceptive faculty is accordingly, where it proceeds from the brain, a suspicious sign, as it indicates cerebral inflammation or apoplexy in acute states and in chronic disease of the mind.

49. A momentary disturbance, a confusion in the perceptive faculty, where the consideration of the relation to the external world becomes lost, dizziness, vertigo, take place, when the individual perceptions cannot be fixed, whether because of their following each other too rapidly, or presenting themselves in too great number, or because the brain is too diseased to follow its perceptions, though succeeding each other with only their ordinary degree of rapidity. The first species is dizziness of the sense; the latter, dizziness of the brain. Both are a sign of cerebral affection, only that occurring in dizziness of the brain is of a morbid character, and both manifest themselves

by illusions of the senses, disorder of the stomach, and weakness of the muscular system; the patient trembles, and ultimately falls: fainting often follows. The higher degree, where it becomes dark before the eyes, was called *vertigo tenebricosa*, in opposition to *vertigo simplex*.

50. Dizziness may proceed from the brain itself, or from other parts of the nervous system, where the brain is but sympathetically affected. Idiopathic dizziness occurs in anæmia and hyperæmia of the brain, in inflammation, softening or hardening of the same, and further in case of tumours arising in the brain and its cavities. It is accordingly observed in persons exhausted after great losses of blood; in convalescents, when they wish to sit erect in the bed; it accompanies diseases of the heart, and of the liver, and typhus; it comes on after suppression of the cutaneous secretion, exanthems, hæmorrhoids; it precedes bad cases of acute exanthems. Narcotics, and several irrespirable gases, likewise call it forth. Sympathetic dizziness may depend on the sight, on the hearing, on the smell of narcotic substances, on the nerves of the stomach, in consequence of overloading or irritation of the intestinal canal, on pregnancy, and on worms. Under this head also may be classed dizziness before hysterical, hypochondriacal, and epileptic attacks, as that also occasioned by the bite of a serpent.

51. Sympathetic dizziness affords a more favourable prognosis than idiopathic. At the onset and at the height of acute diseases, it is suspicious, as in these cases it indicates hyperæmia, or inflammation of the brain. If the dizziness occurs repeatedly for a length of time, the prognosis is bad, as organic changes in the brain are to be dreaded. In persons disposed to apoplexy, it is an important precursor of the same. In gastric states, it indicates crisis by vomiting, epistaxis, and diarrhœa. *Vertigo tenebricosa*, when it does not indicate epilepsy, is a precursor of apoplexy.

Dizziness before the eruption of the acute exanthems is a sign that the disease will be serious, and in small pox that it will be confluent.

Signs from the Memory.

52. The memory is sharpened in states of animal magnetism, and sometimes shortly before death, where it is connected with exaltation of the other mental powers.

53. The diminution of the faculty of memory is divided

into dysmnnesia, where the patient remembers with difficulty, and amnesia, where he has entirely lost memory. Dysmnnesia arises chiefly in consequence of overloading the brain with blood, through inflammation of it or of its membranes, its softening, or pressure on it by any tumour whatever. It precedes disturbances of the higher intellectual faculties, and accompanies them as well in acute as in chronic diseases, and accordingly divides the prognostic import of the same. Before the eruption of acute exanthems, it indicates violence of the disease. It is a precursor of attacks of epilepsy, of St. Vitus' dance, as well as of apoplexy.

54. The loss of memory extends either to everything that has preceded, or only to a part. It is always a sign of a more serious disturbance of cerebral life than dysmnnesia, either from organic changes, as from apoplexy, cerebral pressure, extravasation into the brain, cerebral inflammation,—or from great debility of cerebral action in acute diseases, as in plague, in the yellow fever, in nervous and putrid fevers,—or in chronic affections, as in fatuity.

In acute diseases, it is an unfavourable sign, particularly if no delirium follow; as also where it shews itself permanently in chronic diseases. In hysterical and epileptic patients, it precedes the attacks. If the memory does not return, after acute diseases, with the return of the strength, it generally remains lost for ever. The partial loss of memory gives a better prognosis than the total loss.

Signs from the Higher Intellectual Functions.

55. The exaltation of the faculty of judgment, and of the will, is found to exist in florid, scrofulous, and in rachitic children; in a considerably higher degree it occurs in nervous fevers, at their commencement, and towards death, in the form of ecstatic delirium; as also in many attacks of mania, and in magnetic states; in catalepsy, in hysteria, and in melancholy in rare cases. It is only in the nervous stage of fever that it has an unfavourable import.

56. Weakness and the cessation of these functions (stupor) are indicated by difficulty or incapacity in understanding questions or giving answers, in stupidity of countenance, and immovable dejection. In general there is weakness of the memory, indifference to every thing which formerly interested the patient, and a desponding state of mind.

Stupor manifests itself in nervous fevers, in cerebral inflammation, and in softening of the brain; in pressure on this organ, and in apoplexy. In these cases it is a very dangerous phenomenon. It is further a sign of idiotism and of fatuity. It sometimes arises from congestions in the brain, occasioned by gastric irritation, or worms in the intestinal canal, where it accompanies eclampsia. In these cases, the prognosis is more favourable. The intellectual faculties are momentarily suspended in swooning and apparent death, lethargy, coma, &c. The loss of consciousness at the commencement of an acute disease is of unfavourable import.

57. The higher intellectual functions may go on according to other laws than those observed in the normal state; hence delirium is occasioned. The irregularity may lie as well in the ideas themselves, as in the manner in which they follow one another. It must be distinguished from mental imbecility, from the fancies of sleep, or of the half-awake state; and also from the state where the patient is distressed by delusions of the senses, but is still perfectly conscious that they are delusions. When he begins to take them as true, he passes into the state of delirium. Delirium has various degrees of semeiological importance, according to the accompanying phenomena, its duration, form, intensity, the change in the mental faculties, and their direction.

58. The accompanying phenomena, especially on the part of the vascular and nervous system, and the relation in which they stand with respect to delirium, divide the latter into the acute form, usually called febrile mania, and the chronic form, unattended with fever. Febrile mania is characterized by its appearing suddenly with some disease of the system which occurs rapidly, and by its increasing and declining with it.

59. Acute delirium is always a sign of brain affection. This may be affected by primary irritation or inflammation. In most cases, however, the original seat of the disease is not in the brain, and this organ is but secondarily affected. This may occur in two different ways; by the nervous system, and by the vascular system. In the former, it appears to arise after epileptic attacks, in the hysteric paroxysm, after painful operations, with which exhausting mental sufferings were connected, and in the irritation of worms. This, which is called nervous delirium, does not give an unfavourable prognosis.

If the diseased organs act on the brain through the medium of the vascular system, there arises a state of hyperæmia, a secondary inflammation of the brain and its membranes; an anæmic state also of the brain may be viewed as a cause of delirium. If it occur after great loss of blood, or after colliquative secretions in tubercular consumption, it is very dangerous. It is much more favourable if it occur at the height of fever, if it be directly proportioned to it, and if it increase and diminish with it. In what is called the crude stage of fever, in inflammation of the thoracic and abdominal organs, in jaundice, in the cold stage of intermittent fever, it is a dangerous phenomenon. Before crisis, however, as before the eruption of acute exantheams, and with critical vomiting and purging, and critical epistaxis, delirium is not unfavourable. In like manner it is less dangerous when it occurs after the use of narcotics, or after the abuse of spirituous drinks. If, on the contrary, it occurs with great prostration of strength, paleness of the countenance, and involuntary motions, as in internal suppurations, in the third stage of pneumonia, uterine phlebitis, puerperal peritonitis, and in typhus, the prognosis is bad.

It is to be observed that many persons, as those of nervous temperaments, children, and young persons, often become delirious in the slightest fevers; delirium in such cases deteriorates the prognosis proportionably less.

60. The chronic delirium which has occurred without the rapid appearance of any disease, and bears no relation to such, is moreover characterized by integrity of the perceptive functions, and the absence of vascular irritation, by which it may be distinguished from most of the cases included under acute delirium. Chronic delirium affords, by the direction which the mental action takes, some clue with respect to its corporeal basis.

61. The longer the delirium continues in fevers, the sooner does the disease prove fatal, or leave the nervous system in a debilitated state after the disease. Relapses of chronic delirium hold out but unfavourable prospects of cure.

62. According to the form which it assumes, delirium has been distinguished into the muttering species (delirium *mussitans*), which generally presents itself combined with great debility, and affords an unfavourable prognosis, and the furious species, (*del. furibundum*.) In acute diseases, the latter is a sign of cerebral inflammation, or cerebral irritation;

it may present itself in violent inflammations in the chest or abdomen; and should it occur at the commencement of these inflammations, a severe degree of disease may be apprehended.

63. Slight delirium is that in which the patient can be roused to perfect consciousness by external excitation; it affords a more favourable prognosis than the violent form of the affection. The degree of delirium in cerebral inflammations is directly proportioned to the danger and severity of the disease.

64. The kind of delirium is determined by the faculties of the mind which are changed, and their especial direction, as well as by the delusions of the senses connected therewith, as also by the changes in the propensities, &c.

Delirium extends either to all the mental powers, or the patient is affected only in reference to some single point. A constant rapid alternation of ideas, a delirium vagum, affords a more favourable prognosis than a continual adherence to one and the same idea. The delirium in typhus (typhomania) presents a peculiar form.

65. Calm delirium, succeeding the furious form, gives a good prognosis, except when it is accompanied with a sinking of the vital powers. Gloomy, anxious ideas, and foreboding of death, are unfavourable signs. If the delirious patient appears insensible, and indifferent to his safety, the prognosis is bad.

Delusions of the senses, and of common sensation, as also morbid muscular motions in delirium, will be considered in their respective places.

66. The sudden cessation of delirium, without being followed by crisis, the other signs of a severe disease still continuing, indicates the approach of death. If the patient sleeps tranquilly after delirium, the prognosis is good.

Signs from the Passions.

67. Most diseases produce more or less change in the character; this happens mostly in consequence of a sympathetic affection of the brain. These changes have considerable influence on the prognosis, whilst to the diagnosis they contribute very little. They may occur with or without delirium. Sudden change of character is in general a suspicious sign.

68. Passions of a serene kind, as joy, hope, love, belong more

particularly to thoracic diseases. Pulmonary tubercles are characterized, for instance, by the hope of a speedy cure. Should these feelings arise in other chronic diseases than those of the chest, they are a favourable sign. They increase the activity of the organs. At the commencement of acute diseases, great serenity of mind is unnatural and suspicious. Boisterous joy at the commencement of acute diseases presages a long duration; in their latter stage it precedes delirium. Pleasing feelings in convalescence are favourable signs.

69. Melancholy feelings—as fear, despair, and sorrow—occur most frequently, though not exclusively, in diseases of the abdomen, more especially in its upper region, and chiefly in chronic diseases. Here the patients consider their state more dangerous than it is; they are anxiously solicitous about their health. Under this class may be ranked hypochondriasis, melancholy, irritations and inflammations of the abdomen. A slight degree of melancholy is natural at the commencement of every disease. Should these melancholy feelings, more especially despair, and a foresight of speedy death, present themselves in other diseases than those just named, or should they accompany nervous fever, the prognosis is bad; they may take their rise through the disease or through the mind.

70. Calmness of mind, and patience, are good signs. If, however, this calmness, or even a certain serenity of mind, presents itself at the height of the disease, without a previous crisis, the prognosis is very bad. Indifference to everything, even to that which was formerly deeply interesting to the patient, and more especially with respect to self-preservation, is of unfavourable import, and a sign of primary or secondary brain affection; it presents itself in the transition of a fever into the nervous stage, and in this stage also in typhus, plague, yellow fever, small pox, internal suppurations, then in hydrophobia, scurvy, and in mental diseases, only however from congestions in the brain.

71. Unusually great excitement from the action of external causes, where patients shrink with fright at an inconsiderable noise, is a sign of irritation of the central parts of the nervous system; it is observed after exposure to acute contagious diseases, after poisoning with strychnine, brucine, picrotoxine, in convalescence from typhus, in hysteria, hypochondriasis, and epilepsy.

72. Moroseness of manner is, in acute diseases, a sign of hyperæmia of the brain; whilst in chronic diseases it indi-

icates hypochondriasis, irritations and inflammations of the intestinal canal. In acute diseases, it is a sign well deserving attention, as inflammation of the brain may form readily, particularly in children. Violent passion is a sign of organic cerebral disease, or of chronic affections of the intestinal canal or of the liver, of hypochondriasis, and of hysteria.

Signs from Sleep.

73. The semeiological import of sleep varies according to its duration, profundity, and the mode in which the individual goes to sleep and awakes; according also to the functions which continue to act unnaturally therein, and according to its effect on the system.

74. Natural sleep is under all circumstances a good sign: after delirium, after crisis in fever, after the paroxysms in nervous diseases, it precedes amendment. The more natural the relation between sleeping and waking continues in acute diseases, the better is the prognosis, more especially if the patient is awake by day, sleeps some part of the night, and if the sleep refreshes him. Mental diseases only form an exception; if in them the sleep returns without any diminution of delirium, the disease is of long duration, or incurable.

75. The duration of sleep varies according to age, temperament, mode of living, &c. It varies inversely as the period of life. Persons of a sanguineous temperament, who exercise their bodies very much during the day, sleep more than persons of a phlegmatic temperament, or than persons of sedentary habits.

Short sleep, or total absence of sleep, is quite natural at the commencement of acute diseases, especially those of the exanthematous class, and also in those connected with great pain, such as rheumatism, or with cerebral irritation, as inflammation of the cerebral membranes. In the more advanced period of the disease, the absence of sleep, if not combined with the precursory signs of crisis, is a suspicious sign, as in nervous fever, more especially if the patient is already very weak, and sleep is not prevented by pain. It is then, especially if it lasts for some time, frequently the precursor of fever, delirium, inflammation of the brain and its membranes, of nervous affections and mental diseases. Long continued sleeplessness, in chronic diseases, is a sign of some cerebral affection, of inflammation of the brain or its membranes, of sanguineous and serous effusions, cerebral pressure, of hyperæmia of the brain in consequence of chronic diseases of the heart, intestinal canal, and liver.

76. Excessively long sleep and somnolency are oftentimes habitual. In diseases, somnolency and an inclination to sleep have two sources. 1st. Cerebral disease, particularly hyperæmia, inflammation, softening, effusion into the same, concussion, and cerebral pressure. In acute diseases, it arises from these causes, before the crises have as yet taken place, as also in inflammations of important organs, in phthisis, scurvy, after the removal of cutaneous eruptions, ulcers, and tumours. Where apoplexy or cerebral inflammation is to be dreaded, somnolency should be considered as suspicious. 2nd. Somnolency may arise from the want of sleep felt by the system, as in convalescence, particularly from acute diseases, after long sleeplessness, intense pain, after delirium with the occurrence of crisis; after the appearance of cutaneous eruptions, after paroxysms of hysteria, hypochondriasis, and gout. In the last stage of phthisis, much sleep forebodes speedy death.

77. According to the depth and soundness of the sleep, several states of it have been distinguished, such as sopor, coma, lethargy, carus. Sometimes it is difficult to awaken the patient; in carus, most difficult, and generally impossible; if he do awake, he is indifferent to the external world, as in sopor; or he cannot collect his senses, nor determine well where he is, as in lethargy, and instantly falls again into a profound sleep. If the patient fall suddenly into this deep sleep, it is called coma. In many cases of this coma, the patient endeavours to resist the sleep, as in coma vigil in contradistinction to coma somnolentum.

78. These different degrees of deep sleep are always signs of some cerebral affection, either congestion or inflammation, as in nervous fevers, after suppressed hæmorrhages, in intermittent fevers, in the acute exanthemata, in inflammations of other organs through irritation from worms, or in consequence of apoplexy, extravasation of blood in injuries of the skull, from exudation of serum or lymph, from ramollissement, or concussion of the brain; then come the higher degrees, lethargy and carus.

Coma somnolentum appertains to epilepsy, catalepsy, eclampsy, hysteria, and many forms of cerebral inflammation; it also presents itself as a pecursory symptom of death by intense cold. The coma vigil is a phenomenon of nervous fever.

79. The higher degrees, as lethargy and carus, are of a very unfavourable import, as is also coma vigil in nervous fevers. The coma somnolentum is not an alarming or suspicious phenomenon in itself, except in acute diseases. The

lower degrees of profound sleep, as sopor, are a suspicious sign at the commencement of acute diseases ; they give occasion to dread the occurrence of cerebral inflammation and apoplexy, especially if habitual discharges, as hæmorrhages, perspiration from the feet, chronic cutaneous eruptions, and ulcers, have been suppressed. The more the signs of a disturbed cerebral action, as delirium, convulsions, subsultus tendinum, &c., are associated with sopor, the worse the case is. If the face be red, it indicates a more intense hyperæmia of the brain, and is more unfavourable than a pale face. If sopor takes place shortly before the occurrence of crisis, it is frequently a favourable sign ; in hysteria, hypochondriasis, and epilepsy, these states are not dangerous.

80. Rapid and sudden falling asleep is observed in case of great fatigue ; after crisis, it is a good sign ; before such, it is a suspicious one,—it then precedes sopor. Sudden falling asleep is connected with coma somnolentum.

Uneasy sleeping occurs, if the organs which are less active in sleep are in a state of excitement, more especially the brain and nervous system, the organs of respiration and circulation ; accordingly, in irritation of the brain, in nervous fevers, (coma vigil,) in hysteria, hypochondriasis, melancholy, hyperæmia of the lungs, and in organic diseases of the heart and large vessels, patients sleep uneasily.

81. Frequent awaking indicates some disturbance of an important organ.

Sudden awaking under a state of disturbance soon after falling asleep is a sign of hydrothorax, organic diseases of the heart, and of hypochondriasis.

Awaking, where the patient cannot recollect himself for some considerable time, has been observed in states of profound sleep, and sometimes in children, in consequence of the irritation of worms.

82. In normal sleep, the action both of sense and mind is suspended ; common sensation and voluntary motion are almost entirely at a stand ; the respiration is rarer, and more equable ; the circulation slower.

The greatest deviation from the normal state of sleep is presented by somnambulism ; it occurs chiefly in gastric irritations in consequence of worms, and at the time of puberty, when the growth is proceeding rapidly. Occasionally it precedes nervous fevers. Dreamwalking is somnambulism where the patient subsequently remembers what has occurred.

83. Partial continuance of mental activity takes place in dreams; they are analogous to delirium, which is commonly preceded by lively dreams. Dreams may also be caused as well by mental excitement as through morbid activity of the brain. Frightful dreams occur from cerebral congestion in a great number of diseases; at the commencement of acute diseases they are a sign that the attack will be serious, and before the occurrence of crisis they are of favourable import. They may, however, likewise take place in diseases of the intestinal canal and liver, as also from overloading the stomach, the irritation of worms, and constipation. In hydrothorax, the patient dreams that he is being suffocated.

Dreaming of fire, or of blood, occurs chiefly in inflammations, and before hæmorrhages. If the patient dream that something is compressing his breast (*incubus*), congestions to the lungs or stomach are present. This phenomenon is observed to occur in overloading of the stomach, from sleeping in damp rooms, after suppression of bleeding, in hypochondriasis, and in heart affections. In many of these cases, one would be warranted in dreading cerebral irritation or apoplexy.

84. Involuntary muscular motions and convulsions in sleep may be a consequence of dreams or not. They are occasioned by congestions towards the brain, at the commencement of acute diseases, particularly of the acute exanthemata before the eruption, or from irritation of the intestinal canal, from intemperance, the irritation of worms, and in bronchial catarrh. Under this head may also be classed taking fright in sleep, in consequence of which the patient sometimes awakes: grinding the teeth in sleep presents itself under the same circumstances, more especially in irritable patients.

If these phenomena present themselves in the late period of acute diseases, delirium is to be dreaded, and in chronic states, apoplexy and epileptic attacks.

The respiration and circulation, if inflammation be present, are frequently accelerated in sleep, whilst they are perfectly natural in the waking state.

85. Healthy sleep refreshes; if, however, during sleep, the functions of the brain, muscles, lungs, or heart, do not enjoy their due state of rest, or if the intestinal canal, which during healthy sleep develops great activity, be disturbed through irritation, inflammation, hypochondriasis, &c., the patient awakens unrefreshed and in an uncomfortable state.

Signs from Fainting.

86. Fainting approaches very close to a profound state of sleep. In both, if they are perfectly formed, consciousness is absent; they are distinguished from each other by the cessation of voluntary motion, circulation, and the diminution of the respiration in fainting, whilst these functions go on unimpeded in the states of sopor.

87. Four degrees of fainting are distinguished:—1st, *Eclipsis*. The patient becomes pale, is seized with dizziness, has black appearances before the eyes, experiences tinnitus aurium and nausea, but he retains consciousness, voluntary motion, &c. This is not properly fainting, but only a precursor of it.—2nd, *Leipothymia*. The patient becomes pale and cold, voluntary motion ceases, the circulation and respiration become weak, consciousness indistinct.—3rd, *Syncope*. These symptoms amount to slowness of pulse, loss of consciousness and of the use of the senses.—4th, *Asphyxia*. The respiration and the heart's action cease, the skin becomes of a marble coldness; this state is of longer duration.

88. The next cause of fainting is to be sought for in the disturbance of cerebral life. The remote causes act (1) either immediately on the brain through hyperæmia of this organ, in diseases of the heart and pericardium, particularly hypertrophy of the ventricles and organic changes on the right side of the heart, in aneurysm of the aorta, in disturbances of the respiration, through excessive heat and cold, through narcotics, and in nervous fevers: through anæmia of the brain from loss of blood, after paracentesis abdominis in ascites; or if the blood enters the brain in an altered state, as in scurvy, chlorosis, several forms of dropsy, also in inflammation, concussion and suppuration of the brain, in cerebral pressure, or finally in mental emotions, particularly fright, anxiety, sudden exhaustion of the nervous power, as in persons struck by lightning, in extensive burns, &c.

Or (2) the remote causes act first on other provinces of the nervous system, and mediately on the brain; the nerves primarily affected may be cerebral or spinal nerves, as, in sensitive persons, strong odours, or the sight of several matters, may bring on fainting; needle operations on the eye sometimes produce it, as also contusions, the action of contagion and miasmata, several gases, as carbonic acid gas: or else it is the ganglionic nerves which receive the first impression, as through gastric

irritation, intestinal inflammation, worms, emetics, severe hunger, spleen disease, affections of the womb, pregnancy, parturition, also violent squeezing of the testicles, cramps and pains, more especially in hysteria, hypochondriasis, epilepsy, and eclampsia.

89. In the first division of faintings, the prognosis is, generally speaking, unfavourable, with the exception of that which may occur from exhaustion by loss of blood, which is frequently a real effort of nature, and also that which occurs in chlorosis. Faintings of the second division present nothing dangerous, and in some measure are a relief to the patient, except those produced by miasmata and contagion, which forebode a severe attack of disease.

Signs from Common Sensation.

90. Common sensation is the faculty whereby the peculiar state of the body is conveyed more or less clearly to the consciousness of man; the morbid changes of this faculty arise either from the morbid state of the organs, or of the sensitive nerves which conduct the internal sensations, or of the brain itself.

The consideration of the phenomena belonging to this part of the subject divides itself into that of the changes of the faculty, and into that of the sensations as experienced by the individual.

91. The faculty of obtaining information of the internal state of the system may be exalted, diminished, suspended, or depraved. An exaltation of common sensation characterizes hysteria, hypochondriasis, and the magnetic state; it is observed also in inflammation of the brain, and of the membranes of the cord.

92. Diminution amounting even to a cessation of this faculty is observed in very torpid insensible persons, but is more strikingly displayed in cerebral diseases, more especially in apoplexy, in serous effusion, ramollissement, than in typhus, and in all states through which consciousness is lost. In these cases, it is in general diminished or suspended. Local deficiency of common sensation arises either from the spinal marrow, through inflammation or softening of the same, from pressure on this organ, or gangrene of the part concerned. Deficiency of common sensation in a part which should naturally possess it, is a bad sign, more especially in inflammation of the thoracic and abdominal organs. If it be general, and accompanied with

sopor or delirium, the prognosis is unfavourable, as also where motion and sensibility to external irritants is wanting.

93. Depravation sometimes consists merely in an exaltation of common sensation. Depravations of this function have been observed in two directions; either the patient feels himself well whilst from the real state of his disease he should feel himself very ill—this is peculiar to mental diseases and nervous fevers,—or he feels himself much worse than he should, as in hypochondriasis, hysteria, and melancholy. In these diseases, the patient often takes up the most mistaken notions with respect to his state.

94. The sensations which the organism excites in the brain are partly indistinct and indeterminate,—as the feeling of comfort or of discomfort, the sensations occasioning disquiet or anxiety; whilst partly they excite determinate ideas, as those of cold and heat, and of the various modifications of pain.

95. The feeling of comfort is a sign that no general disease is present, and that if the disease be local it exercises no unfavourable influence as yet on the entire system. When in acute diseases this comfortable state takes place after crisis, it shews that the general affection has ceased, and has again become local, and accordingly that the violence of the disease has diminished. In such cases, it is one of the surest signs of speedy convalescence. If this feeling of comfort occur at the height of a violent inflammation, without crisis, and is accompanied with a loss of feeling in the part concerned, the prognosis is unfavourable.

96. An uncomfortable feel, a sense of uneasiness, is a precursor of most acute diseases, and a sign of a disposition thereto; accordingly, it is usually experienced after the action of contagion, after the suppression of natural or habitual secretions, of cutaneous eruptions, in plethora, before menstruation, and after conception. During the further progress of diseases it is also observed, more especially in those of the intestinal canal, than in hysteria and hypochondriasis.

97. A higher degree of uneasiness is that wherein the patient falls into a state of restlessness, which evinces itself in his temper and his movements.

The cause lies either in the nervous system, as in cerebral inflammation, in hypochondriasis, hysteria; or the perversion of some function, especially that of the intestinal canal, and of the respiration, is found to correspond with the gloomy feelings

which give rise to the patient's restless state. In acute diseases, if it appear immediately at the commencement, it indicates a rather serious affection; if it occur in the progress of the disease, it forebodes the occurrence of inflammation of the brain, as in children; or of the pericardium; the lungs; obstruction, inflammation, and softening of the intestinal canal. When occurring about the time of the crisis, it is a favourable sign, as it indicates the commencement of critical action. If it continue after the crisis the prognosis is bad. A feeling of disturbance, leading to internal restlessness, accompanies the last struggle of death in such as die with perfect consciousness.

In chronic diseases, it indicates chiefly disturbance of the respiration by tubercles, by hepatization of the lungs, heart disease, or diseases of the intestinal canal, liver, or spleen.

98. The highest degree of disturbance of common sensation produces anxiety. Besides the constant change of position and of place, it also evinces itself by the dread of approaching death.

A distinction is commonly made into mental and bodily distress. Mental distress proceeds solely from the state of the mind; we have now only to do with that which regards the state of the body; if this is not founded in superstition, it is always referrible to some corporeal cause.

99. Bodily distress may have its origin in the nervous system (nervous anxiety), as in hysteria, hypochondriasis, and many nervous fevers; it may be the precursor of hydrophobia and tetanus, or it may occur in disturbances of important functions, more especially of the respiration, circulation, and digestion; it may proceed also from the extremities. The accompanying phenomena shew what the nature of it is.

100. Distress from the respiration and circulation (*anxietas cardiaca, pulmonalis*,) occurs in all diseases of the heart, great vessels, and pericardium, if they disturb the circulation, in diseases of the lungs and pleuræ, which render a considerable portion of the lungs impervious, more especially if this occur suddenly.

Under this head may be classed the anxiety which precedes the cold stage of fever, and crisis, at the same time that the nervous system itself appears to be here also affected. The prognosis is accordingly better in this than in the other cases of pulmonary distress. The higher this distress proceeds,

and the longer it lasts, the more dangerous is the case; it may ultimately pass into the anxiety of death, (*anxietas moribundorum*.)

101. Anxiety from the abdomen (*præcordial anxiety*) arises from irritation of the intestinal mucous membrane by worms, from inflammation of the same parts by acrid poisons, in typhus, gastric fevers, in cholera, in the hepatic flux, dilatation of the stomach and duodenum, enlargement and disorganization of the liver, spleen, pancreas, lesser omentum, and in neuralgia *celiaca*.

Abdominal anxiety does not render the prognosis worse, unless when it is produced by the action of poisons.

102. Anxiety arising from the extremities is slight and transient. It takes place when ligatures are placed on the limbs in consequence of congestions; change of a long accustomed position, sudden motion after long rest, suppression of perspiration, and gout also produce it.

103. Great anxiety, when it follows close on severe pain of inflammation, yields an unfavourable prognosis, as suppuration or gangrene may have then occurred. Sometimes it indicates infection by the contagion of typhus. In nervous fevers, long continued anxiety is of dangerous import.

104. The more distinct and defined impressions produced on common sensation are to be referred rather to the thoroughly established forms of disease, more especially irritation, inflammation, and fever; whilst the more indistinct impressions, as we have seen, are rather to be considered among the precursors of disease, the transitions from one state to another, &c.

105. The feeling of cold or heat is in many diseases not directly proportioned to that observable on the skin; the skin is even frequently cold, whilst the patient complains of great heat, and vice versâ. The feeling of cold and of heat depends partly on a morbid state of the nervous system, partly on acceleration or retardation of the functions which produce animal heat; partly also on a closing or too great opening of the passages through which the heat escapes outwards.

106. The feeling of cold presents several degrees; in the higher, as rigor and shuddering, the patient puts his muscles into motion, in order to lighten this feeling. Moderate feeling of cold indicates the commencement of the action of a disease hitherto local, or of an external agent on the entire system, and particularly on the sanguineous system, whereby diminution of the functions which create animal heat ordina-

rily takes place. It is accordingly observed in irritation or inflammation, as the commencement of fever, and before active hemorrhages; in hysteria, hypochondriasis, epilepsy, and melancholy, it precedes the paroxysms and exacerbations, and accompanies them; in stoppage of the secretions, it indicates the commencement of reaction. If the feeling of cold be local, unless it be of epileptic, hysterical, or hypochondriacal origin, it is occasioned by the impression which the entrance of a dead or less animated body into the system produces, as the effusion of other fluids than blood into one of the cavities of the body; for instance, after perforation of the intestines, the bursting of organs, or in hydrothorax, in gangrene of some internal part, in the passage of stones through ducts, or if the liver or spleen be disturbed in their function in consequence of degenerescence. A feeling of cold along the vertebral column is a sign of spasms and convulsions, particularly of tetanus. A feeling of cold in the extremities is of suspicious import in all gastric inflammations, and in nervous fevers. If a general feeling of cold continue for a long time, with great sensibility to cold, a chronic disease of the respiratory or digestive organs is mostly the cause, as dyspeptic affections, pulmonary, and especially mesenteric tubercles.

107. A considerably intense feeling of cold before every febrile paroxysm distinguishes intermittent from remittent fever. A long continued rigor before the fever forebodes a violent paroxysm. A feeling of cold in the external parts, whilst internal heat exists, is a bad sign. If a cold feeling occur suddenly after severe pains, suppuration, gangrene, or bursting of some internal organ, has taken place. If the cold feeling return in the course of the disease, there is reason to apprehend a complication, an extension of the disease to other parts, a conversion of it, or a relapse, unless it be intermittent fever.

108. Shivering is a cold feeling, which extends from the back, neck, or abdomen, to the external parts. It arises under the same circumstances as the simple feeling of cold, only it denotes a disease violently affecting the system, or such a disease as is connected chiefly with disturbance of the cutaneous secretion.

In the former case, it presents itself during the commencement of violent diseases, as also in the infection of plague or typhus; in nervous fevers creeping on slowly; in extravasation of blood into the brain, during the pressure of foreign bodies on

the cranial cavity : also during the transition of one form of disease into another, especially in those diseases which affect deeply the sanguinous system, as in internal suppurations, for instance in phlebitis ; in consequence of the occurrence of an inflammatory complication, of metastasis in fevers ; at the commencement of dropsy ; in violent evacuations. Shivering, also, in hysterical or hypochondriacal paroxysms, belongs to this head.

To the latter cause shivering occurring in catarrhal, rheumatic, and exanthematous diseases chiefly belong.

109. The diagnostic import of shivering depends on the accompanying phenomena. If it present itself in inflammations, with collapse, great anxiety, weak soft pulse, and low delirium, suppuration may be dreaded. Shivering connected with the disappearance of an acute exantheme leaves reason to apprehend an internal inflammation ; and in variola, internal suppuration. Before the eruption of the exantheme it has not this unfavourable import. Shiverings which arise from the first cause above mentioned are bad, except in hysteria, hypochondriasis, and infection with acute contagion ; the prognosis in the cases mentioned under the second head is much more favourable. Shiverings after crisis are suspicious as to the prognosis. Shiverings at the height of acute diseases which are connected with debility, stupor, or cold sweats, are bad. Shivering followed by heat is more favourable than that which is without it.

110. A rigor is a feeling of considerable cold, combined with stiffness and cramps of the muscles. It is the highest expression for the action of a local disease on the entire system.

It accordingly occurs in the more violent paroxysms of intermittent fever, especially in quartans, as also at the commencement of violent pulmonary inflammations, the first stage of plague, typhus and putrid fever ; it also arises from internal suppurations, and infection of the blood with pus, the effect of disorganization on the general system, in hysterical and hypochondriacal paroxysms, at the commencement of tetanus.

In intermittent fevers, rigors are not dangerous ; they are so, however, in thoracic inflammations, as being then a sign of the grey or extended red hepatization. If large evacuations have preceded them, the prognosis is bad. In extensive suppurating surfaces, rigors indicate the absorption of the pus ; in the later stage of acute or chronic diseases, they are a sign of inflammatory complication, or of internal suppuration ; both cases are very bad.

In a regular quartan, the rigor may be of tolerably long dur-

ation ; a too long duration, however, leaves reason to apprehend apoplexy. In typhus, one may conclude on a short course from a violent rigor. A rigor combined with the signs of exhaustion is a forerunner of death.

111. Heat depends partly on the state of the conducting nerves, partly on the exaltation of the functions which create animal heat, partly also on the stoppage of the secretions which throw out animal heat. The first impression of a disease hitherto local, or of an external agent on the system, is followed by an increased activity of the respiration, circulation and absorption, with diminution of secretion and nutrition ; in consequence of this, the animal heat rises, as may be found frequently on the skin, and on the mucous membranes accessible to observation through the thermometer, and still more evidently by the feel. To the feeling of the patient it appears much greater, and then even when no increase of temperature is observable externally, the conditions necessary for such a phenomenon—viz., exaltation of the functions which produce animal heat—are found to exist. They are not present in nervous diseases ; the cause of the sensation of heat observed in them lies in an anomalous state of the conducting power of the nerves.

112. Heat is an important sign of fever. It manifests itself accordingly as well in irritations as in inflammations ; in the softening of tubercles, in suppurations ; also in hysteria and hypochondriasis. Diminished heat is more especially peculiar to rheumatism, catarrhs, inflammations of slight extent and in organs of slight importance ; also to hysteria and hypochondriasis. Great heat is a sign of acute exantheams, or of nervous turn of fever ; and of a change in the blood.

113. Duration and extent is of importance in the sensation of heat. A long continued heat gives reason to expect a speedy termination of the entire disease in recovery or death. If the heat, which at the commencement of the fever was abating, still continue, the prognosis is bad. In irritations, as in intestinal and pulmonary catarrhs, rheumatism, as also in tubercles, the heat abates periodically, in order to rise again afterwards. If the heat intermits, it is a sign of intermittent or of hectic fever.

If the heat be of very short duration, merely passes off, (*calor fugax*.) one may infer a slight affection, more especially slight irritation of the stomach with difficult digestion, or pulmonary catarrh, congestion in some organ, preceding hæmorrhages, or the first impression of tubercles on the system. It may also make

its appearance as a sign of hysteria. Heat which alternates for a long time with transient shiverings is of suspicious import, more especially at the commencement of low nervous fever. The prognosis is still worse if the degree and seat of both vary every time. Spinal inflammation in children is characterized by frequent alternation of shivering and transient heat.

114. According to its extent, the feeling of heat is distinguished into that which is general, and that which is local. The general form is a favourable sign in fever.

The local form is either a sign of inflammation going on in the part where the heat is felt, or of congestion in the same, or of chronic affections of the organs which generate animal heat, particularly of pulmonary tubercles, of chronic affections of the abdominal organs, indigestion, or of suppurative fever. In these cases, it is felt more particularly in the palms of the hands and soles of the feet. It appears also in hysterical and hypochondriacal affections.

115. After the heat has lasted a certain time, it ceases, and the secretions succeed. If the heat continue after evacuations, hæmorrhages, the eruption of exantheams, in an equal or higher degree, or only commences then for the first time, some new irritation or inflammation, the increase of a previously existing inflammation, or a nervous turn of the disease, may be apprehended.

The more the sensation of heat is accompanied by those other signs observable on the skin, the better is the prognosis. An internal feeling of heat, where the skin is cold, natural, or inconsiderably warm, always indicates internal irritations, inflammations, or hysteria and hypochondriasis.

If intense heat ceases suddenly, or gives way to cold, the prognosis is bad.

The feeling of warmth suddenly changes its seat in many diseases (*calor erraticus*), as in hysteria, hypochondriasis, catarrhs, intestinal inflammations, and in nervous fevers.

116. Under the name of pain are comprehended all determinate disagreeable impressions on common sensation. It is the impressive warning of nature before the approach and presence of danger. With respect to diagnosis, it is very important, by indicating the suffering organ, and frequently also the kind of suffering, by its quality. With respect to prognosis, it is no less important.

117. Pain is a phenomenon shared by a number of affections; it is more particularly observed in inflammations, irritations, and in nervous diseases. It obtains various diagnostic and

prognostic import according to its nature, seat, increase by external pressure, duration, intensity, and the phenomena under which it ceases.

118. Dull, heavy pain, (*dolor gravidans, obtusus*,) is a sign of hyperæmia or inflammation of a parenchymatous organ, of effusion into some cavity, or of an internal tumour. It often precedes hæmorrhages.

Tensive pain (*d. tensivus*) occurs in neuralgia, in inflammations of mucous membranes, in the eruption of variola, in the formation of abscesses, in ascites, tympanitis, and plethora. Burning pain (*d. urens*) characterizes violent inflammations, particularly of the general integuments, and of the subjacent cellular tissue, as carbuncles, and the buboes in plague. Pulsating pain (*d. pulsans*) is either a sign of violent congestion in some part, or of the transition into suppuration. Lacerating pain (*d. lacerans*) indicates rheumatism. It also occurs in arthritis.

Perforating pain, (*d. perforans*) accompanies chiefly inflammation of the periosteum and of the bones, (therefore called *d. osteocopus*.) It occurs most frequently in consequence of syphilis and scurvy,—in the former during the night, and in the diaphysis of the long bones, in the latter at the ends of the joints.

Pungent pain (*d. pungens*) indicates irritation and inflammation of the fibrous and serous tissues; that which shifts its place denotes inflammation of the dura mater, of the spinal cord, whilst sharp stings of pain denote cancer.

Gnawing, biting pain (*d. rodens*) is a sign of cancer, and of several cutaneous eruptions, morbilli, rubeola, herpes, miliary eruption, eczema, scabies, prurigo, impetigo, zona, &c.

119. Prickling, itching, tickling pain, and formication &c., arise when they extend over the entire body, partly from the nervous system, in organic diseases of the brain and spinal cord, in hysteria, epilepsy, hypochondriasis, delirium tremens, ergot, diseases of the kidneys, partly from the heart in organic diseases of the same organ, partly again from chronic affections of the abdomen, wandering arthritis, irritation and inflammation of the intestinal canal, if it manifest itself in the abdomen, before bleeding in the trachea, or bronchi. The sensation of villication takes place as well in the face as in the throat and air-passages, and appears to be connected with chronic diseases of the intestinal canal, with hypochondriasis and hysteria. Besides these varieties, there are still endless shades of pain,

which throw much light on the nature of the disease, but may not be described in words.

120. The seat of the pain affords, in most cases, the surest information as to the organ which is affected, and is on that account of diagnostic importance. However, one cannot always depend on it; pain often manifests itself only at the aperture of the organ, especially of the mucous membranes, often only at a remote part of the nerve which comes from the diseased part, often in the organs which have most influence on the morbid part, and vice versâ. For the importance of the pain in the different parts, see the latter. Pain in internal parts is in general more dangerous than that of external; and if the latter follow the former, and follow acute internal diseases, the prognosis is so much the better; if the reverse occur, it is more unfavourable.

121. Fixed pain is a sign of a continued affection, and accordingly more especially of inflammation and neuralgia. If the pain be fixed in several different parts, this is occasioned either by the consent of the organs, or the same morbid process is in different organs, as tubercles, gouty or syphilitic inflammation, rheumatism, or lastly, the central organs of the nervous system, as the brain or spinal cord, are inflamed.

Wandering pains (*d. vagi*) manifest themselves, (1) in disturbances of the nervous system, especially in chronic diseases of the brain and spinal cord, in hysteria, hypochondriasis, in pellagra, and in organic diseases of the heart; (2) in diseases which throw the whole system into a morbid state, especially rheumatic and gastric fevers, typhus, small-pox, putrid fever, scurvy, gout, constitutional syphilis, *plica polonica*, and chronic abdominal affections.

122. Increase of pain on pressure is a characteristic sign of inflammation, in contradistinction to irritation, where it is not increased by pressure on the suffering part, as in catarrhs, and rheumatism.

Diminution of pain on pressure characterizes neuralgia and the neuroses, more especially facial pains and *inegrin*; as also many rheumatic affections.

123. With respect to duration, pain is distinguished into the transient, permanent, remittent, and intermittent.

Transient pains occur partly in affections of the spinal cord and its membranes, partly in slight irritations, in hyperæmic states of internal organs; in rheumatism also, and before a paroxysm of gout.

Permanent pain characterizes inflammation, and many processes connected with disorganization. The longer the pain lasts, the sooner are degenerescences to be dreaded. Remittent pain belongs not only to inflammation, but also to irritation, such as catarrhs of the respiratory organs, of the intestinal canal, &c., and rheumatism. In constitutional syphilis, and in arthritis, the pains are also mostly remittent. In catarrhs of the respiratory organs, in rheumatic attacks, arthritis, and syphilis, the exacerbation is in the evening, and in gastric catarrhs and inflammations in the morning.

Intermittent pain is a sign of neuralgia, of intermittent fever, of rheumatism, and of gout. The pain in hæmorrhoids or disturbed menstruation returns after longer intervals. If the pain return when the organ is to exercise or exalt its functions, this is the surest sign of disease of the same, as when a limb pains on motion, or the intestinal canal after eating, or the chest on taking a deep inspiration.

124. The violence of the pain depends partly on the state of the nervous system, partly on the degree and extent of the inflammation or irritation, partly on the anatomical quality and situation of the affected part. If the pains are very violent in irritations, as in those of the intestinal canal, of the skin, and in rheumatism, there is reason to dread that the case will pass into inflammation, or that the same is about to occur in other organs. If inflammation be present, violent pains indicate supuration.

Slight pains denote either a slight affection, or, if they be of long continuance, a slow chronic course; degeneration of organs is then frequently discovered.

A violence of pain proportioned to the kind, extent, and degree of the disease is a favourable sign.

Absence of pain in a disease, where it is ordinarily present, indicates either a chronic course or some cerebral affection, loss of consciousness, or of sensation.

125. Among the circumstances which precede and follow the occurrence of pain, those of paralysis and of loss of sensation are more especially to be mentioned. If pains occur in parts which are paralyzed and devoid of sensation, those parts at the same time remaining warm and even red, the prognosis is favourable. In the paralysis occasioned by lead, the pains have not this favourable import. The occurrence of internal pains after the commencement of critical movements is an unfavourable prognostic. If the pains cease suddenly without

the other symptoms abating, this is either a sign of commencing debility or of gangrene of the part affected. If, on the contrary, the cessation of the pain coincide with the remission of the fever, and the reestablishment of the secretions, the prognosis is favourable.

[For the import of the pain according to the organ which is the seat of it, and the forms of disturbed sensation peculiar to individual organs, the reader may consult the signs from the general integuments, the organs of sense, those of motion, digestion, respiration, circulation, and the genital organs.]

Signs from Pain of Head.

126. Pain of head is of great importance as a sign of disturbed cerebral life, and mediately of a series of morbid states of other organs. We must distinguish the external pain of head, which is increased by touching the painful part of the head, from the internal pain. The external is mostly of a rheumatic, gouty, or syphilitic origin, or erysipelas of the head is present, inflammation of the pericranium, of the cranium itself, or even caries. In consumption, the external pain of head is an unfavourable prognosis.

The internal pain of head is in general a sign of hyperæmia, of irritation, inflammation, suppuration, softening, medullary sarcoma of the brain and its membranes. Hyperæmia is mostly a consecutive state; it seems to be the cause of pain of head at the commencement of a number of acute sthenic diseases, that which is observed in catarrh, after the suppression of hæmorrhages and cutaneous eruptions, in gastric diseases, &c. Pain of head is the slightest sign of cerebral affection; it frequently precedes the more severe signs, as delirium, &c.

Its prognostic and diagnostic import varies according to its seat, as also according to its kind and duration.

127. If the pain is spread over the entire head, inflammation or hyperæmia is the cause of it at the commencement of a nervous fever, particularly of typhus. A local, long continued pain of head, especially when accompanied by paralysis of the limbs, &c., is a sign of a local cerebral affection, more particularly of softening, and cancer. Frontal pain, if it depend not on catarrh, inflammation, or caries in the frontal sinuses, chiefly indicates inflammation of the cerebral membranes, and hyperæmia, in consequence of intestinal and hepatic disease.

If the frontal pain appear in other diseases, they are always complicated with gastric disturbance.

Pain in the orbital region is commonly occasioned through inflammation of the cerebrum, in hydrocephalus, in congestive states of the eyes ; it precedes amaurosis.

Unilateral headache is felt chiefly in the temporal region ; it is a sign of irritation of the brain ; accordingly, it is very common after intense mental exertion, in hysteria, in rheumatism, and gout.

Pain at the vertex of the head is sometimes a sign of inflammation, sometimes of hysteria, and hypochondriasis.

In the posterior part of the head, pain manifests itself chiefly in inflammation of the cerebral parts situate there, then in hyperæmia, in typhus, and through hæmorrhoidal congestions.

128. Pain may assume various forms. Heaviness of head forms as it were the lowest degree of pain of head ; it indicates hyperæmia, and irritation of the brain and its membranes, and accordingly precedes catarrh, nervous fever, the acute exanthems, and occurs in gastric disturbances, and in hepatic disease. Heaviness of head precedes cerebral inflammations and hydrocephalus.

If in the same states the dull oppressive pain of head presents itself, it indicates moreover softening of the brain and apoplexy.

Pulsating pain of head is in like manner a sign of hyperæmia of the brain, as in delirium tremulum, heart disease, and many forms of insanity ; it also occurs in inflammation of the brain and of its membranes, and in hysterical irritation.

Perforating pain of head always indicates deep-seated organic disturbances of the brain, inflammation, softening, hydrocephalus ; pungent, lacerating, tensive pain, on the contrary, indicates merely functional disturbances, particularly of a hysterical, gouty, or rheumatic form. Lancinating pain is a sign of cerebral inflammation, of cancer cerebri, if it is not rheumatic or connected with nervous fever.

129. Persistent pain of head is a sign of inflammation, softening, and hyperæmia, in consequence of continued diseases ; whilst periodical headache indicates cerebral cancer, cerebral tubercles, water in the head, hyperæmia, the causes of which are periodical, as remittent and intermitent fevers, and irritation of the brain through periodical processes.

II.

SIGNS FROM THE SENSES.



130. THE morbid changes of the organs of the senses have in the case of the eye chiefly reference to the brain ; less so, however, in the case of the organ of hearing. The organ of smell is on the one hand connected with the respiratory organs, whilst on the other it reacts on the brain. The organ of taste is closely connected with the vascular system, and the tongue with the intestinal canal. The faculties of sense are, however, entirely dependent on the brain.

The changes in the functions of the senses are occasioned — (1) by disease of the organs of sense ; (2) disease of the nerves which conduct the impressions on the senses to the brain ; (3) by disease of the parts of the brain which receive the impressions of the senses ; (4) by disease of other organs, which exercise some influence on the brain.

Which of these causes come into play in the individual cases is known from the accompanying signs, and from the absence of those which present themselves usually connected with the other causes.

In a prognostic sense, those signs indicate most danger which proceed from the brain itself ; whilst those are least dangerous which proceed from the organs of the senses, or from other organs, more especially the intestinal canal.

The functions of the senses may be exalted, diminished, and suspended or depraved. All these various changes may come from every one of the above causes.

131. Exaltation of the functions of all the senses is observed sometimes in hysterical and hypochondriacal states ; the cessation of them all may precede bad nervous fevers, may occur at the height of these same affections, and also in convalescence from them. In acute diseases, it is in general a good sign that the senses continue in their natural state ; and if their functions were disturbed, that they have again become normal at the time of the crisis, and after it.

Signs from the Eye.

132. In the eye, the changes of its volume, its position, its colour, form, of its brightness, its motions, of its glance and power of seeing, merit a more particular explanation in a semeiological point of view. The changes in the lachrymal organs naturally come in here. These morbid changes are partly signs of a local morbid process going on in the organ itself, partly of a disease of the brain, and partly, in a word, of a morbid state extending to the brain and eye.

133. Morbid enlargement of the eyes arises through congestion in the organ, hydrophthalmus, and medullary sarcoma. Abnormally large and small eyes may also be congenital. Morbidly small eyes are occasioned by atrophy, suppuration, or loss of separate parts of the eye.

134. The position of the eye depends on the turgid state of the structures lying behind it, and is often deceptive with respect to its size. Protruded eyes, where the protrusion is gradual and permanent, is a sign of tumours developed behind the ball of the eye, as of encysted tumors of the lachrymal gland, of fatty and other tumours, aneurisms, exostoses, osteo-sarcoma, of tumours which extend from the cerebral, nasal, or maxillary cavities into the orbit, or diminish this cavity; lastly, inflammation of the adipose tissue behind the eye-ball, or the general inflammation of the ophthalmic cavity, may gradually protrude the globe of the eye. The eye may be forced by these causes to one side. If the eyes are rapidly protruded, where the protrusion does not attain a high degree, as in the chronic form, it is a sign of hyperæmia of all the organs of the cavity of the eyes. With these signs, hyperæmia of the brain is always present, a state consecutive on cardiac and pulmonary affections, in cases of suffocation, in nervous fever, in violent spasmodic attacks of a hysterical or epileptic nature; or it is the brain that is inflamed; delirium and apoplexy are then to be dreaded.

135. Sinking of the eye (the hollow eye), where it goes on gradually, and continues, is a sign of atrophy of the parts behind the globe; it accordingly occurs in all consumptive diseases, and here it is a bad sign; it also occurs after long fasting. If it take place rapidly, it may be ascribed to diminution of turgescence, as in all febrile states, particularly in the acute exanthems, after bloodletting, violent evacuations, and cholera. It is here always a sign of a severe disease. This sinking commonly affects both eyes. If only one appear sunk, some local

affection of the brain is present. In fevers, it is looked on as a fatal sign; but it may also depend on worms in the intestinal canal, on hysteria, and also on hemiplegia.

136. The red colour of the conjunctiva, a sign of congestion and inflammation of the same, indicates hyperæmia and inflammation of the brain, in those acute diseases to whose natural course it does not belong, this only occurring in catarrhal fevers, and the acute exantheis. In chronic diseases, apoplexy and degenerescence of the brain are partly the causes, and partly chronic gastric disturbances. The conjunctiva is swollen, and of a dark red colour, in violent inflammations of the eye, in consequence of extravasation of blood, after injuries, or in scurvy, and in putrid fever. A granulated appearance of the conjunctiva palpebrarum is a sign of blenorrhœa of the eyes. The yellow colour of the conjunctiva has the same import as that of the epidermis.

A dirty brownish colour of the conjunctiva yields a very unfavourable prognosis; it is always a sign of a vitiated state of the blood, as in putrid fever, typhus, bad small pox, and measles, and in internal gangrene.

A fine rose-red vascular net-work under the conjunctiva is a sign of sclerotitis, and points to a rheumatic origin. Injected vessels in the cornea are signs of ceratitis. The course of the injected vessels of the conjunctiva is looked on as indicating the nature of the inflammations of the eye. White opaque specks on the cornea are occasioned by inflammation, of which injuries or scrofula may be the cause; if cicatrices be on it, ulceration was present.

137. Discolouring of the iris, yellow specks, exudations of lymph on it, and in the pupil, are signs of iritis; if it be of a dirty grey colour, and covered with small red or yellowish grey elevations, syphilis is present. In gouty inflammation, the iris is ashen grey, dull, as if it had been washed out.

Extravasated blood in the chambers of the eye afford an unfavourable prognosis for the eye in scurvy, and in the internal inflammation of the eye; if such extravasations are occasioned by injury, or in consequence of great bodily exertions, the prognosis is not unfavourable.

A fluid in the chambers of the eye, sometimes yellow, sometimes of a milk-white colour, changing its position with the different motions of the head, indicates suppuration of the eye.

A red or dirty grey turbidness in the bottom of the eye is caused by medullary sarcoma. Change of colour in the site of

the crystalline lens, from greyish white to yellow, brown, and dark brown, and dark grey, are a proof of cataract; whilst greenish turbidness indicates glaucoma.

138. The changes of form in the eye-ball and its separate parts are referrible, so far as they are not occasioned by wasting or destruction of the entire ball, to changes of the cornea, sclerotic coat and iris.

The cornea may be too flat, or too convex; it may be attenuated or protruded in a flaccid state, or thickened, conical and tense, at the same time opaque, or transparent, sometimes adherent to the iris; it may present in one part a vesicular protrusion of the internal membranes of the cornea or iris; all these changes of form are of importance only for the eye itself, as they may modify vision more or less, or render it impossible.

The changes of form of the sclerotic coat present a similar import, more especially its rupture, or protrusion of the choroid. Flaccidity of the sclerotic is sometimes the consequence of consumption, or of tendency to dropsy; it may, however, likewise be produced by local debility of the sclerotic. Varices of the choroid are generally the reflection of constitutional diseases, more especially of gout, scrofula, &c.

139. The form and size of the pupil possesses much more diagnostic importance, especially for disease of the brain, and the sympathetic nervous system. A narrow pupil, in acute diseases, is a sign of hyperæmia or inflammation of the brain, and of the first stage of hydrocephalus. A dilated pupil, where it is not caused by cataract, or an obstruction to the entrance of the rays of light, indicates sympathetic cerebral irritation by gastric disturbances, worms, after hysterical and epileptic fits, or cerebral pressure, by exudation, as in dropsy of the brain, for instance, cerebral inflammation, through exudation of blood, and several of the narcotic poisons. It is therefore, when combined with soporose states, an unfavourable sign. Distortion of the pupil may be congenital, or it may be occasioned by iritis. Its dislocation upwards and inwards appears to be peculiar to syphilitic iritis.

140. The lustre of the eye is very closely connected with the state of the brain. It is stronger in hyperæmia and inflammation of the brain, and in apoplexy. Its increase precedes and accompanies chronic and acute delirium.

The lustre of the eyes fails in profound sinking of the strength, at the commencement generally of all violent acute diseases, after inordinate secretions, great excess, in consumption, heart

disease, in all acute affections where the nervous system betrays great debility. If the blood is at the same time vitiated, as in typhus, in the Asiatic cholera, in putrid fever, or gangrene, the eyes appear of a dirty dull colour, as if covered over with a fine powder, or shining like glass; the prognosis is then very unfavourable.

141. The motion of the eyes, if free and not involuntary, gives a favourable prognosis. Immobility of the eyes is a sign of tonic spasm or paralysis of the muscles of the eyes, and accordingly of cerebral disease, more especially exudation and apoplexy, and also of epilepsy and catalepsy. Too violent movement of the eyes is a sign of clonic spasm, or of a rapid succession of thoughts; it presents itself accordingly in all acute affections of the brain, and indicates apoplexy, delirium, general spasm, or crises, as the eruption of small pox. Diminished mobility is connected with turning of the eye-ball upwards, as in sleep; it is therefore, except in the case of amaurosis, the sign of the most profound debility, and it is observed chiefly in cholera, typhus, and putrid fever.

142. The faulty direction of the eye-ball may be permanent, (*lucitas*,) and then the cause lies in the muscles of the eyes, or in the straitening of the orbit on one side; it may also take place only in vision, in the voluntary movement (*strabismus*), or through involuntary movements of the eye-ball, (*distorsio oculorum*.)

Squinting, where it is congenital or acquired by custom, has no further semeiotic import. If it occur in diseases of the brain, particularly in hydrocephalus, cerebral inflammation, or apoplexy, it yields an unfavourable prognosis, as also in hydrophobia, in nervous fevers, except at the time of crisis, when it yields a better prognosis. If it be connected with other signs, of worm irritation, or with hysterical or epileptic symptoms, it has not this unfavourable import.

143. Distortion of the eyes takes place through clonic spasm; where it accompanies general spasms, it derives its import from these; without these, as in hydrocephalus, in typhus, and in putrid fever, it makes the prognosis very bad. At the commencement of acute diseases, as in small pox, distortion indicates a violent disease, but not a bad termination.

144. The motions of the iris have the same importance as those of the eye-ball. A fixed iris is either a consequence of a tonic spasm or of paralysis; these states may be entirely local, may be connected with congestions, inflammations of the eye

and iris, even with amaurosis ; frequently, however, the ultimate cause lies in the brain, in inflammation of this organ, in apoplexy, hydrocephalus, in typhus and nervous fevers, and then a fixed iris has an unfavourable prognostic import. If the disturbances, on the contrary, are in the abdomen, if the irritation of worms, hypochondriasis, or hysteria, be the occasion, it does not make the prognosis worse.

Diminished movability of the iris is common, connected with muscular debility ; for instance, in chlorosis, consumption, apoplexy, after epileptic fits, in spasms at the commencement of acute diseases. Increased movability is occasioned by irritation or inflammation of the brain, whether idiopathic or sympathetic ; in fevers it indicates the latter.

Involuntary motions of the iris (clonic spasm, hippus) accompany general clonic spasms ; they may also present themselves alone through local affections of the iris.

145. Under the look or glance is comprehended the entire impression which the eye makes on the observer. The changes in the look of the individual generally harmonize with those of the features. There is a wild look, an anxious look, and a despairing look.

The wild look is a sign of irritation, hyperæmia, or inflammation of the brain ; it is accordingly frequently combined with delirium, and precedes apoplexy.

The timid look is usual at the commencement of acute diseases ; it also belongs to hysteria and hypochondriasis, before the attacks of which it is more especially expressed. An anxious look characterizes all heart diseases. A despairing look appertains to violent inflammations of the abdomen, to softening of the stomach, and to the Asiatic cholera.

146. Increased secretion of tears indicates either congestion or irritation of the lachrymal glands, as in ophthalmic inflammation, and before epistaxis, or it is a sign of an affection of the nervous system, as in nervous fevers, gangrene, where it yields an unfavourable prognosis ; in hysteria and hypochondriasis, in which it precedes a violent attack. We must not confound with this any obstruction of the organs which bring away the tears, which obstruction is occasioned by catarrh, inflammation, strictures of the lachrymal sac and duct, by stones contained therein ; these give rise to swellings of the lachrymal sac.

The diminution of the lachrymal secretion is partly a consequence of inflammation of the lachrymal glands at the commencement of ophthalmia ; it is partly occasioned through the com-

mencement of fever, when all the secretions become scanty. The caruncula lachrymalis is red and swollen in inflammation, hypertrophy, and cancer of this part; in ophthalmic blenorrhœa, more especially the Egyptian ophthalmia; and also in congestions to the head. It is pale and sometimes swollen in all chronic diseases, more especially dropsy, scurvy, and chlorosis.

147. The power of vision is sometimes observed to be exalted in nervous fevers. The sensibility of the eye to light is much more frequently increased (photophobia) 1st, in inflammations, and in irritations of the brain and its membranes, and in hyperæmia of the brain in consequence of a number of acute diseases of other organs, and in mania. 2nd. In diseases where the sensibility in general is exalted, as hysteria and hypochondriasis, and in recovery from acute diseases. 3rd. In inflammations of different parts of the eye, more especially in catarrhal inflammations, in those of variola, rubeola, scarlatina, scrofula, and arthritis; in inflammation of the iris, of the capsule of the lens and of the retina; a diminished degree of sensibility of the eye to light is day-blindness, nyctalopia, where the patient can see only by twilight and in weak light. It occurs under the same circumstances as photophobia.

148. Diminution and loss of the power of vision (amblyopia and amaurosis) are occasioned, 1st, by disease of the brain and the optic nerves, as at the termination of chronic diseases accompanied by great exhaustion; by anæmia of the brain, by its ramollissement, by tumours which become developed in the brain, syphilitic exostosis, by inflammation of the neurilemma of the optic nerve, in acute diseases through hyperæmia and inflammation of the brain. If it arise from these causes in chronic diseases, or remains behind after acute disease, the restoration of vision is no longer to be expected. Blindness caused by exhaustion of strength yields an unfavourable prognosis, as also where it presents itself combined with delirium in acute diseases. During hysterical and hypochondriacal paroxysms, a transient diminution of vision takes place. 2nd. The cause may lie in disease of the abdominal organs, more especially in irritation of the intestinal canal, in the irritation of worms, in degenerescences of the liver and spleen, in intermittent fevers (amaurosis intermittens). The power of vision may in these cases be again restored, if the eye itself has undergone no organic change.

A third source of diminution of vision lies in the eye itself: the parts lying before the retina may be impervious to the

light, or the retina is filled with blood, inflamed, paralysed, or changed in structure; or lastly, pressure has been made on the frontal nerves. Short and long sight (myopia, presbyopia) are occasioned by varieties in the structure of the cornea and the other anterior parts of the eye-ball. The black appearance before the eyes is the acute form of diminution of vision. It always proceeds from the brain, as in vertigo, slight syncope, in the nervous stage of fever, before convulsions in epilepsy, in great debility, also in violent congestions to the head, and so before apoplexy, critical epistaxis, and vomiting.

149. The deprivation of the faculty of vision consists partly in the incorrect vision of real objects, partly in the vision of objects which are not present.

The former includes half vision, interrupted vision, double vision, and deformed vision, as well as the change in clearness and colour. Half vision (*visus dimidiatus*), where the patient sees only half the object, and interrupted vision (*visus interruptus*), where he sees only the lateral parts, but not the middle, are partly occasioned by turbidness of the transparent parts lying before the retina, partly by paralysis of the retina, partly, if it continue, by a change of the optic nerve and optic thalamus; lastly, the cause may be in the abdomen; worms, degeneration of the liver and spleen, hypochondriasis, and hysteria, frequently produce these species of abnormal vision.

150. Double vision (*visus duplex*), when it depends not on partial turbidness of the transparent media of the eye, on a double pupil, or on the different convexity and position of the eyes, is a sign of debility of one retina; or if it take place in one eye, of unequal excitability of the individual parts of the same. It may also proceed from irritation, inflammation, and effusion into the brain, from organic diseases of the same organ, or from hysteria, hypochondriasis, worms in the intestinal canal, intoxication, chronic diseases of the liver and spleen, accumulations in the abdomen. Double vision from disease of the retina is a sign of impending amaurosis. In acute diseases and in gout, it is a sign of metastasis to the brain; in diseases of the spinal cord, as *tabes dorsalis*, double vision shews a complication with cerebral disease, and therefore renders the prognosis more unfavourable.

Deformed vision (*matamorphopsia*), where one sees objects disfigured, inverted, and crooked, is always a sign of organic diseases of the brain, or of an affection of the bones at the base of the cranium.

151. Objects may appear brighter or darker than they really are, (oxyopia, visus nebulosus.) The former consists in a too strong excitation of the retina from inflammation of neighbouring structures. In inflammation of the brain and its membranes, in cerebral congestions, all objects appear red to the patient. Dim vision depends on slight turbidness of the transparent media of the eye, or on debility of the retina; it gives reason to apprehend blindness.

If a patient sees objects coloured differently from what they are (chropsia), or is unable to distinguish the colours (achromatopsia), it indicates disease of the retina.

152. The seeing of objects which are not present may occur corporeally or mentally; the latter is the case in chronic and acute delirium, where the patient thinks he really sees the objects with which his morbid imagination is occupied.

The seeing of sparks, lights, fiery balls (scintillatio, photopsia), occurs in irritation of the retina, congestions of the eye, in internal ophthalmitis; furthermore, in hyperæmia and inflammation of the brain and its membranes, it precedes epistaxis, apoplexy, and amaurosis in many cases.

153. The seeing of dark points and figures, (midge-seeing, myiodesopsia,) which may rise to nebulous vision, depends sometimes on imperfect turbidness of the transparent media of the eye, sometimes on irritation, inflammation of the retina and the surrounding parts, pressure on it by varicose vessels in the interior of the eye, sometimes on congestions of the brain, or irritability of the nervous system, as in hysteria, hypochondriasis; finally, on irritation of the intestinal canal, worms, and accumulations in the abdomen.

154. The seeing of the forms of men and animals commonly presents itself connected with acute or chronic mania, or precedes it; however, it is also observed without the patient admitting the appearance of these figures as founded in reality. It commonly arises in consequence of congestions in the brain, and irritation of this organ, especially where it proceeds from disturbance of the intestinal canal, as in typhus, in chronic irritation, and degenerescence of the alimentary canal and liver, in consequence of suppressed hæmorrhoids, &c. It ordinarily accompanies mental diseases, principally melancholy.

Signs from the Hearing.

155. The signs from the state of the external ear and the auditory passage, from discharges from this latter, and from

pain in the ear, have far less reference to the diseases of other organs, and especially of the brain, than the signs from the eye. The state of the internal ear, which probably may have more semeiological importance, is almost entirely withdrawn from our observation; the faculty of hearing merely, and the common sensibility of the part, may yield some information.

156. The changes of the external ear are considered among the common integuments. The external meatus is sometimes the seat of abscess in tuberculosis and the acute exantheams. The discharge from the ear presents many shades, as do the morbid secretions from mucous membranes in general, from a thin sero-mucous to the purulent form. Just as various are the diseases which give rise to it, from catarrh of the aural mucous membrane to inflammation and suppuration of the same, and even to caries; the discharge may come from the internal ear, even from the brain, in suppuration of this organ and caries of the bones of the cranium. The prognosis is to be directed by the various origin of the discharge. The running from the ear sometimes indicates a metastasis, as after suppressed secretions of other organs. Like other mucous discharges, it frequently appears in tuberculosis and syphilis.

A bad smell from the ear accompanies aural discharges, particularly those which are of a syphilitic or scrofulous origin, and where caries is the cause. It takes place also from interruption in the secretions of other mucous membranes, especially of the intestinal canal, in leucorrhœa, &c. Increased secretion of the aural secretion appears to be a favourable sign in typhus and apoplexy. In the case of gall stones, it is diminished and changed.

157. Discharge of blood from the ear is a sign of inflammation, of injury, or of hyperæmia of the aural mucous membrane. This latter is generally combined with congestions to the brain and with cerebral inflammation, and then affords a suspicious prognosis. In scurvy and purpura it is a sign of a very severe degree of disease.

158. Pain in the ear partly indicates irritation and inflammation in the ear, or in the contiguous parts of the brain and cerebral membranes; it appears also to be of a nervous character, as in hysteria and gout. After injuries of the head, and during signs of cerebral inflammation, it is mostly a fatal sign; in nervous and exanthematous fevers, it indicates inflammation and suppuration in the ear, and accordingly it leaves reason to dread the loss of hearing in the affected ear.

159. Exaltation of the faculty of hearing manifests itself by more acute hearing, and by the pain occasioned by a noise in itself inconsiderable ; it is a sign of catarrh and inflammation of the ear, or of irritation, hyperæmia, inflammation of the brain and its membranes. This phenomenon is accordingly seen in many acute diseases, and in those chronic diseases which exercise a chronic reaction on the brain, as gout, hypochondriasis, melancholy, and hysteria ; it precedes delirium, spasmodic attacks, more especially of an epileptic and tetanic character. In acute diseases, it renders the prognosis suspicious.

160. Hardness of hearing and deafness may depend, 1st, on disease of the internal or external ear, on narrowing of the meatus auditorius, thickening of the membrana tympani, obstruction, catarrh of the Eustachian tube, or inflammation, suppuration in the internal ear, in the mastoid process, defects in the small bones of the ear, organic malformations, disease of the auditory nerve ; 2nd, the cause may lie in the brain, in hyperæmia of itself and its membranes, as in acute diseases, in auriæmia of the brain, as in the last stage of consumption, in organic changes of the organ, as through apoplexy, cerebral softening, lastly in concussion of the brain ; epilepsy and fainting are commonly accompanied by it ; 3rd, the difficulty of hearing may also proceed from the intestinal canal, no doubt through the medium of the brain, through the irritation of worms, in degenerescence of the liver, and in obstruction.

161. Difficulty of hearing through disease of the internal ear in consequence of small pox, syphilis, debility from age, as also that which is congenital, is mostly incurable, less so that which has its cause in the meatus, or Eustachian tube. In nervous fevers, it is a good prognostic, if it appear after delirium with crisis ; bad, on the contrary, if it alternate with delusions of the ear, with exaltation of hearing, or precedes delirium. Difficulty of hearing, or deafness, as a sign of organic cerebral disease, when accompanied by other signs of the same, is of unfavourable import. If the cause is to be sought in the intestinal canal, the prognosis is favourable.

162. The hearing of tones and sounds without there being any external corresponding cause, (tinnitus, susurrus, syrigmus aurium, &c.,) is a phenomenon occasioned by a morbid state of the brain, and its minor degrees, as ringing and noises in the ears, may be produced by inconsiderable changes of cerebral life, even by the will or fancy. The most general cause of this

perversion of the sense of hearing in diseases is hyperæmia of the brain and its membranes. From this cause it seems to arise in acute diseases, in disturbances of the intestinal secretion, in plethora, after suppression of discharges of blood, of cutaneous secretions, in organic diseases of the heart, degeneration of the liver and spleen, at the commencement of suffocation. To irritation of the brain it sometimes appears to owe its origin; as for instance, in hysteria, hypochondriasis, before convulsions in mental diseases, (in the latter, the delusion of hearing reaches its highest degree, the patient fancying that he hears strange voices.) Lastly, anæmia of the brain may occasion these phenomena, as occurs after severe evacuations, great loss of blood, and in consumption. Moreover, the strange sounds sometimes arise also from inflammation, suppuration of the ear, and from closing of the Eustachian tube.

163. The diagnostic import of this phenomenon depends on the accompanying phenomena and the history of the case. If it appear after meals, and in the evening, hyperæmia of the brain will be its cause. In plethoric old persons, it frequently indicates apoplexy. At the time of the crisis, it often precedes critical epistaxis, sweat, and alvine evacuations; at the commencement of acute diseases, on the contrary, it is a phenomenon indicating danger, and mostly precedes delirium or cerebral inflammation; in local ear affections, it is frequently followed by deafness.

Signs from the Organ of Smell.

164. The nasal mucous membrane stands in close relation to the brain and to the respiratory organs; its secretions and hæmorrhages from it are accordingly of great importance for the latter.

The secretions of the nose vary from serum, as it is found at the commencement of catarrhs, and in cerebral inflammations as a very favourable sign, to the thick mucus and pus which appear in the latter period of catarrh, in ulcerations of the nose and the surrounding parts, and which in congestions towards the head afford great relief. The ulcerations are mostly of a scrofulous and syphilitic character. A bad smell is generally found from the ulcerations; the formation of false membranes in the nose denotes the croup of adults, and precedes the extension of the disease to the larynx.

The drying of the nasal secretion into a brown crust is a sign of a typhus turn in fevers; whilst the softening of these crusts is favourable.

Nasal hæmorrhage (epistaxis) is a sign of hyperæmia of the nasal mucous membrane, or of a depraved state of the blood, as in scurvy, purpura, and typhus. As a consequence of hyperæmia of the nasal mucous membrane, it is mostly combined with a similar state of the brain, and this establishes its critical importance. The causes of the hyperæmia lie partly in a plethoric state, in the suppression of normal or accustomed hæmorrhages, partly in disturbance of the circulation from diseases of the lungs, heart, and liver, and partly in active congestions in fevers. In all these states, the epistaxis is a favourable prognostic, in as far as it relieves the state of the brain. Where the blood has become vitiated, profuse epistaxis commonly takes place, which may be attended with danger to the life of the patient, and often precedes hæmorrhages from other mucous membranes.

166. A squeezing in the nose frequently precedes epistaxis and catarrhs, as also itching; the latter, however, is observed still oftener as a consequence of the irritation of worms. If in aged persons this itching be not followed by catarrh or epistaxis, there is reason to apprehend cerebral disease.

168. A very acute smell (hyperosmia) is a sign of a commencing nasal catarrh, or of an irritation or inflammation of the brain and its membranes; thus it may occur at the commencement of typhus, of scarlet fever, or where the entire nervous system is in an irritated state, as in hypochondriasis, hysteria, and epilepsy. At the commencement of acute diseases, it precedes delirium.

169. The want of smell (anosmia) is either occasioned by disease of the olfactory nerves and the nasal mucous membrane, such as catarrh, inflammation, ulcers, and polypi, pressure on the olfactory nerves by tumours of the bones or the brain, or through an affection of the brain, as hyperæmia, inflammation, and apoplexy. Anosmia may also occur from chronic diseases of the intestinal canal.

170. In perversion of the sense of smell, patients have a smell of things which are not at all present to them, or they find in many things different smells from those which healthy persons discover in them. Unless when local diseases of the nasal cavities and of the surrounding parts, as also of the stomach and mouth, are the cause of this symptom, it indicates

profound disturbance of nervous life, as in nervous fevers, hysteria, and epilepsy. In acute diseases, it announces delirium. In pregnancy, it is not an unfrequent phenomenon.

Signs from the Sense of Taste.

171. A too acute sense of taste is a sign of disturbance of the nervous system ; accordingly, in fevers it indicates a transition to the nervous form, and occurs in hysteria and hypochondriasis. Those cases where it may be occasioned by acrid secretions, or want of epithelium, belong not to this place.

172. Want of taste is often the consequence of a thick coating of the tongue, as in gastric diseases, more especially gastric catarrhs, or, where this coating of the tongue is wanting, it arises from irritation, from a plethoric state of the brain, as in many febrile states, particularly those accompanied with delirium, in typhus, putrid fever, in mental diseases, and lastly in apoplexy. If the sense of taste does not return on convalescence, a return of the disease is to be dreaded ; and in gastric fevers, particularly those of an intermitten form, dropsy is to be apprehended.

173. Depravation of taste seldom proceeds from the nervous system, as in hysteria, in the nervous stage of fever, in the epileptic paroxysm ; then the patient finds an agreeable taste in things which have a disagreeable one, and vice versâ, but has not the same sensation of taste from all kinds of food, without, however, deriving any enjoyment. This is on the contrary the case where the depravation proceeds from the secretion of the lingual, intestinal, and respiratory mucous membrane.

174. The insipid taste belongs to catarrh, to inflammation of the respiratory and gastric mucous membrane ; it is accordingly observed in the case of worms, in intermitten fever, and in consumption. Its disappearance with the occurrence of crisis is favourable ; its long continuance gives reason to dread degenerescence of the bowels, or a chronic course of fever. If it still continue after the termination of the disease, there is reason to apprehend a return of the same, or dropsy.

175. The bitter taste is a sign of irritation or inflammation of the duodenum, and of most diseases of the liver. It sometimes accompanies intermitten fever. In pulmonic inflammation, it sometimes renders the prognosis suspicious, inasmuch as it indicates a participation of the liver as well as of the pleura. If it continue for a long time in chronic diseases, degenerescence of the liver is mostly present. If it appear in the morning, and

disappear as soon as the individual has eaten something, it can scarcely be called a morbid state.

176. An acid taste accompanies irritation of the stomach, and is mostly combined with heartburn, acid eructations, &c. If it continue long, there is reason to dread induration, softening, cancer of the stomach, hardening, suppuration, degenerescence, and hypertrophy of the liver, particularly of the left lobe.

177. A salt taste is commonly occasioned on the tongue through the secretions of the bronchial mucous membrane; it accordingly appears in pulmonary consumption, even in its first stage.

The sweet taste is one of the more common delusions of taste in hysteria, hypochondriasis, and nervous fever. Besides these cases, where it seems to proceed from the nervous system, it is a sign of diabetes, of impending coughing and vomiting of blood, and of softening of pulmonary tubercles. It is a bad sign in pulmonary consumption.

178. A foul or even a putrid taste is sometimes occasioned by morbid states of the mouth, jaws, throat, nose, more especially caries and ulcers, and accordingly occurs in syphilis and scurvy; sometimes it proceeds from the intestinal canal in cancerous ulceration of the stomach, in gangrene of the intestines, in abscesses which discharge themselves into the intestinal canal, in ileus, and in putrid fever; lastly, the foul taste is observed in gangrene of the lungs, in abscesses, in softened pulmonary tubercles, and in chronic bronchial catarrh. Accordingly, in chronic diseases, and where it is observed in inflammations, with remission of the febrile phenomena and the occurrence of debility, the foul taste is of unfavourable import.

The urinous taste takes place through long-continued ischuria, and in lithiasis it yields an unfavourable prognosis.

179. The metallic taste is occasioned by the action of metals on the system; accordingly, when quicksilver is administered, it is a precursor of salivation. Hysteria and hypochondriasis sometimes produce it; it also precedes severe epileptic attacks. It is observed in many intermittent fevers; if it continue during the intermission, new paroxysms may be apprehended.

The signs from the tongue may be seen under the head of the "Organs of Digestion."

Signs from the Sense of Touch.

180. Great acuteness of the sense of touch is a sign of disease of the skin, as in the acute exanths, also of irritation and in-

flammation of the brain, spinal cord, and their membranes, of hysteria and hypochondriasis. It frequently precedes apoplexy and paralysis.

181. The diminution of the sense of touch is observed (1) in all states where consciousness is lost, as in syncope, apparent death, in the epileptic paroxysm, or where the mental powers act abnormally, as in acute and chronic delirium, more especially in mania and melancholy; lastly in hysteria and hypochondriasis; (2) in diseases of the skin, and of the subjacent parts, as before the eruption of the acute exanthems, in rheumatism and in gout; (3) in organic diseases of the brain and spinal cord, particularly apoplexy, softening, or pressure by tumours. If motion is not at the same time suspended, the seat of the disease is in the posterior pillars of the spinal cord.

Loss of touch through organic changes of the brain and spinal cord yields an unfavourable prognosis; that which arises from other causes does not render the prognosis worse. In fevers, more especially of the exanthematous character, it precedes the crisis.

182. Perversion of the sense of touch is to be distinguished from the delusions of the common sensation of the skin. On the other hand, to this belongs the case where the patient finds properties in the touched bodies which they have not. This always warrants us in inferring disease of the brain; it is observed in softening of the brain, and in nervous fevers.—*See the article on the "Skin."*

III.

SIGNS FROM VOLUNTARY MOTION AND ITS ORGANS.

I. SIGNS FROM THE ORGANS OF VOLUNTARY MOTION.

183. THESE organs are divided into active (muscles) and passive, (bones, cartilages, and ligaments.) Both species exhibit changes in size, form, flexibility, and sensibility. The morbid changes, especially in the nutrition of the muscles, are a certain standard of the vital power of the other organs, particularly those of respiration and digestion. The physiological varieties in the structure of these parts are of great prognostic value on account of their laying the foundation of many dispositions to disease.

II. SIGNS FROM THE OSSEOUS SYSTEM.

Signs from the Size of the Bones.

184. The general excessive, but uniform, development of the osseous system (*habitus athleticus*), wherein also the muscular structure is unusually great, evinces a preponderating influence of the vascular system on the organs over the nervous system. Accordingly, in such persons, nervous diseases and nervous forms of disease will be more seldom observed, and heart diseases, inflammations, and hæmorrhages, will be more frequent. In such a structure of the bones, inflammations afford a more unfavourable prognosis than in the normal structure, inasmuch as in them debility soon sets in.

185. A too feeble development of bone is usually combined with great nervous irritability. In these patients, cerebral diseases and asthenic forms of disease are most to be dreaded.

186. The predominance of the longitudinal dimension in the osseous system forms the fundamental character of the phthisical habit. The deficiency in breadth has mostly influence on the lungs, which in such a habit are very frequently tuberculous, or in a later period of life are threatened with pulmonary apoplexy and hydrothorax.

The predominance of the dimension in breadth over the length, in the development of the osseous system, disposes to diseases of the abdomen, and to gout; accordingly it was called the arthritic habit.

187. The rapidity in the increase and decrease of the osseous system is of importance in a diagnostic and prognostic point of view. A rapid increase of the osseous structure in length, is a very frequent occurrence in and after fevers, particularly those of the exanthematous kind. With this direction of nutrition and its causes, the development of rachitis and of tubercles, which is so frequently consequent on this rapid growth, seems to be connected. In chronic diseases, it is of unfavourable prognosis as a sign of debility. If the osseous structure becomes developed at an early period, and very abruptly, without any preceding disease, there is reason to expect an early development of the sexual instinct, and in the female sex chlorosis and hysteria.

Shortening of the skeleton occurs through wasting of the bones, particularly in old age, and through *mollities ossium*.

188. The disproportion in the development of the individual

parts of the osseous system affords several anamnestic and prognostic signs.

Excessive development of the skull is a sign of hydrocephalus, of hypertrophy of the brain, and of rickets. It disposes to cerebral diseases. It is necessary to distinguish from this the enlargement of the cranium by fungus of the dura mater, of the pericranium, and through effusion of blood or of pus under the integuments of the head.

The growth of the skull is retarded in idiots and maniacs. It is then usually developed unsymmetrically. If the difference from the normal size is not considerable, and the form is normal, no morbid disposition is indicated. A short neck disposes to cerebral hæmorrhage.

A very broad chest lays the foundation of a disposition to heart disease and hydrothorax, whilst a narrow chest, on the contrary, disposes to pulmonary consumption.

Lengthening and shortening of the extremities occur from diseases of the joints, such as inflammation and suppuration, by dislocation, or by fracture of a bone. The second stage of hip-disease produces lengthening, the third shortening, of the extremity affected.

Signs from the Changes in the Form of the Bones.

189. They arise either through disease of the bones and ligaments, or changes of the organs inclosed by them, or through the action of the muscles. The most frequent diseases of the bones which occasion changes of form are, rachitis, syphilitic periostitis, caries, fracture of the bones, and morbid organization. The ligaments may be the cause of the change in form, through their relaxation, tension, thickening, deposition of tuberculous masses, and of arthritic matter. With respect to the included organs, it takes place more especially in the case of serous effusions, and through morbid organizations which become developed from within.

The preponderance of a set of muscles produces changes of form more especially in the vertebral column and the foot.

190. The skull may change its shape uniformly; if it become acuminate superiorly, or elongated like a pouch posteriorly, it proceeds from a change in the brain itself, especially from hydrocephalus or tumour of the brain, or congenital and acquired malformation of the organ. These forms are found to exist in persons labouring under mental disease and cretinism. Defi-

ciency in the convexity of the brain also occurs in persons affected with mental disease, rickets, scrofula, and gout.

191. Changes in the form of individual parts are occasioned by fungus of the dura mater and skull, by aneurisms, exostosis, depressions from external weight, and cerebral hernia. They yield in general a suspicious prognosis.

192. Too great size of the fontanelles, accompanied by a normal state of the bones of the head, is a sign of hydrocephalus, or of premature birth. If the bones knit too rapidly, there may be grounds for apprehending idiocy, or deafness and dumbness. If they are too long in becoming ossified, either rickets or hydrocephalus is the cause; in this latter case, the fontanelles are considerably protruded. If the fontanelles are sunk, it is a sign of great debility, and is frequently combined with convulsions; it is therefore a precursor of death.

193. Curvatures of the spinal column are either consequences of disturbed equilibrium in the muscular contractions, or of diseases of the bones, especially rickets, scrofula, softening, inflammation, and caries. The prognosis is more favourable in curvatures occasioned by the action of the muscles, than in the latter.*

194. Curvatures of the long bones of the extremities are consequences of rickets, osteomalacia, or badly cured fractures. Great uniform extension of the bones of the extremities comes under the forms of exostosis, osteosteoma, osteosarcoma, and spina ventosa; if they are not occasioned by the action of some external force, syphilis, scrofula, and arthritis are generally the cause. Fungous disease and necrosis also may, however, be the cause of enlargement of the bones. The nature of the disease in a given case may be inferred from the seat, kind of development, and the previous or still existing diseases of other organs.

195. Slight unevennesses in the diaphyses of the long bones are usually the consequences of syphilitic periostitis. Enlargement of the ends of the bones is a sign of scrofula, arthritis, and rickets; it sometimes appears after acute exanthems, and after the expulsion of chronic eruptions; it may also depend on idiopathic inflammation of the medullary membrane of the bone, or of the periosteum, and of the ligaments of the joint.

196. The extremities may also be incurvated by misplacement of the individual bones with respect to each other, which

* See changes in the form of the thorax, under the head of "Signs from the Respiratory Organs."

partly depends on irregular contraction of the muscles, as in club-foot and horse-foot, in contracted states of the limbs, and temporarily through convulsions; it is partly produced by disease of the ligaments, and by the formation of new fibrous bands, as in the case of retraction of the fingers, and of several false anchyloses; it partly depends on the abnormal condition of the ends of the bones; it may be congenital, as in flat-foot, or be occasioned through the deposition of arthritic tuberculous masses, or finally by inflammation.

Signs from the Moveability of the Joints.

197. Want of flexibility in a joint indicates the true, and what is called false, anchylosis. The true (wherein all motion of a joint is suspended) is occasioned by inflammation and caries, which cause the ends of the joint to combine; or the joint is united by exostoses; then it may depend on arthritis, and most, even all, the joints of the body may be united by exostoses, which are found in a great measure outside the surfaces of the joint, and often run along the entire length of an extremity. In false anchylosis the moveability is not destroyed by a uniting of the bones. This happens in consequence of changes of form in the head of the joint, in consequence of luxations, through arthritic depositions around the joint, disease of the ligaments and muscles, more especially rheumatism, or by tumours in the proximity of the joint, which prevent motion, as aneurisms for instance.

Signs from the Sensibility of the Bones.

198. Pains of the bones are in general of a perforating kind; if they are felt in the diaphyses, a syphilitic cause may be suspected; in scurvy they are close to the joints, sometimes however they are also in the diaphyses. Pains in the joints occur in gout, rheumatism, scrofula, intermittent fever, after acute exanthems, after the repulsion of chronic eruptions; they commonly precede inflammation of the ligaments and bones, the deposition of morbid products, suppuration and caries, or they indicate the presence of these states as well as that of the absorption of cartilage.

Signs from the Muscular System.

199. Excessive development of the muscular system is sometimes combined with great development of bone, as in the athletic

habit of body; in other cases, the bony system is of ordinary dimensions. This hypertrophy of the muscular system disposes to heart diseases and to violent inflammations. The foundation of organic diseases of other organs is sometimes laid by immoderate exertion of the muscles.

200. A state of nutrition proportioned to the activity of the muscular system is, of all the signs which the external appearance of the body yields, that which indicates with the greatest certainty a yet unbroken state of health. A deficiency of fat is very commonly combined with perfect health. The muscular system may however be sufficiently developed, and still the foundation of a fatal disease be laid, as for instance at the commencement of pulmonary consumption. But if a chronic disease has already lasted for a long time without producing atrophy of the muscles, the prognosis is more favourable than when emaciation is present.

201. In febrile diseases, especially the acute exanthems, atrophy of the muscles towards the end of the disease is natural, and may even have a favourable influence on the termination of it; should it, however, occur at the commencement, it is of a suspicious nature.

If during convalescence the muscles continue to waste, or not to increase, there is reason to apprehend the continuance of inflammation or disorganization. In chronic diseases, wasting is of an unfavourable import, particularly that of the muscles of the face; it is most decidedly expressed in tuberculosis, less so in chronic suppurations, inflammations, softening, dropsy, and mucous discharges.

202. If particular sets of muscles waste away, this depends either on long inaction of them, or on disease of the brain, spinal cord, and the corresponding motor nerves, and lastly on deficiency in the supply of blood to them. Thus the long muscles of the spine waste away in tabes dorsalis, those of the extremities from diseases of the brain and spinal cord, as well as of their nerves, whereby paralysis is soon produced, and by stopping up of the principal arteries and veins.

203. Pains in the muscular apparatus arise either from the nervous system, as in diseases of the brain and spinal cord and their membranes, from the influence of contagion, as of the febrile exanthems, of typhus, in hysteria, hypochondriasis, worm disease, or from the vascular system, and blood in organic diseases of the heart, pleura, liver, stomach, in putrid fever, in scurvy, and before hæmorrhages. Pains in the muscles fre-

quently precede hæmorrhages; more especially pains in the nape of the neck precede those from the nose; pains in the loins and small of the back precede menstruation and the hæmorrhoidal flux. Lastly, muscular pains may arise through irritation or inflammation of the muscular apparatus; to these belong rheumatic and gouty pains, as also those which are produced by immoderate exertion.

204. In order to determine which of these causes may be the acting one in a given case of muscular pains, attention must be paid to the accompanying phenomena. The cause will be sought for in inflammation of the brain or spinal marrow, if paralysis of one side occur slightly, and if after this loss of sensation or convulsive phenomena should present themselves. Headache is at the same time present, and disturbance of the sensorial action. Paralysis of the muscles, loss of sensation, and disturbance of the sensorial action, are observed much later in softening of the brain, much sooner on the contrary in apoplexy.

The muscular pains from the vascular system are characterized by the signs of disturbed action of the heart, of enlarged liver, through extravasation of blood under the skin, &c., and by the signs of congestion towards the affected part; whilst in idiopathic muscular pains these signs are wanting, and a considerable fever soon forms.

205. In reference to prognosis, pains which set in with disturbance of the sensorial action, and precede paralysis and loss of sensation in the limbs, are a bad sign; but if pains return in a paralyzed insensate part, they are to be looked on as a sign of improvement. Muscular pains at the commencement of fever give reason to apprehend a violent disease; if they continue after the eruption of an exanthem, the disease is nervous. Muscular pains with signs of congestion towards a part are frequently of critical import. In organic disease of the heart, liver, &c., they precede serous exudations, and are on that account an unfavourable sign. The return of rheumatic pains in the limbs after pericarditis is favourable; their disappearance frequently coincides with commencing diseases of the serous membranes.

206. Muscular pains in the left shoulder and arm belong to diseases of the heart, more particularly to peri and endo-carditis; pains in the right shoulder and arm appertain to diseases of the liver, and principally to inflammation of that organ. Pains in the nape of the neck are frequently a kind of crisis for cerebral irritation; sometimes they precede this, as also epistaxis. Pains in the lumbar region may be purely rheumatic, or a sign of hyperæmia

of the uterus, rectum, bladder, or of impending hæmorrhages from these organs, or of inflammation of the kidneys, lumbar vertebræ, spinal cord, and its membranes, &c. ; and lastly, of neuralgia. Pains in the superior and inferior extremities of one side mostly proceed from the nervous system, or from the heart.

Pains in all the four extremities at the same time occur chiefly in vitiation of the blood in putrid fever and scurvy. In that which is properly rheumatism, the pains are either wandering from one fasciculus of muscles, or one joint, to another, so that one part only is principally affected, or the pain is constantly fixed to one part.

Neuralgic pain in the limbs is distinguished from the rheumatic pain by its course along the nerves and its occurrence in paroxysms.

207. The feeling of weight, lassitude, and a sleepy state of the limbs, are to be considered as disturbances of sensation peculiar to muscles.

The feeling of weight in the limbs arises from three causes:—(1) from plethora, accordingly in suppression of the menstruation and other hæmorrhages and secretions ; (2) from weakness of the nervous system, as for instance through the influence of contagion, particularly of typhus, plague, small-pox, influenza, &c., and also in convalescence ; (3) through defective nutrition, in acute diseases of the intestinal canal.

208. The feeling of lassitude (*dedolatio*) arises—(1) from the debilitating action which a disease or an external agent, as contagion for instance, exercises on the nervous system ; thus it is very marked at the commencement of fever, before the paroxysms of intermittent fever, before hysterical and hypochondriacal paroxysms, and before crises ; (2) from a change in the blood, as in scurvy and putrid fever.

The greater the feeling of lassitude is before a fever, the more reason is there to dread a nervous turn and a depravation of the blood. The plague, the yellow fever, typhus, putrid fever, the acute exantheas, are characterized by great lassitude. If the lassitude cease not after the termination of the fever, some local disease has remained behind.

209. The feeling of sleepiness in the limbs evidently arises from interruption of the circulation in the extremities, as also from the eruption of the miliary exanthem. It is, however, also a sign of a cerebral affection ; it precedes apoplexy, and the epileptic paroxysms. At the commencement of acute diseases, it indicates the nervous character of them.

SIGNS FROM THE FUNCTIONS OF THE VOLUNTARY MUSCLES.

210. This class of signs is of the greatest importance with respect to the diagnosis and prognosis of organic diseases of the brain and spinal marrow, and the surest measure for the state of the patient's strength.

They are divided into those derived from the voluntary motions and those from the involuntary, those removed from the dominion of the will.

Signs from the Voluntary Motions.

211. The exaltation of the voluntary motions is a sign of cerebral inflammation or cerebral irritation; it is always combined with furious delirium, and presents itself accordingly in inflammation of the brain and its membranes, in violent inflammations of the thoracic and abdominal organs, in nervous fevers; lastly, in hydrophobia, in many cases of hysteria, and of mania. It always yields a suspicious prognosis, except in mania, particularly if the disease is not confined to the brain, but this organ becomes only secondarily affected.

212. Diminution of the faculty of voluntary motion, debility of the muscles, depends partly on the state of the nervous system, partly, and in a particular manner, on the sanguineous system. It occurs in a great number of diseases; in most diseases of an acute form, immediately at their commencement, among the precursors, before the occurrence of fever and during its continuance; in chronic diseases, generally then only when they have made great progress, except where the nervous or vascular system is diseased, as in chronic diseases of the brain and spinal marrow and their membranes, and in those states combined with change in the composition of the blood, as chlorosis or scurvy, through interruption of accustomed hæmorrhages, more especially menstruation, after great loss of blood, violent evacuations, where it occurs immediately at the commencement of the disease. In diseases of the pulmonary parenchyma and of the intestinal mucous membrane, it is expressed more decidedly than in those of the other organs. The action of contagion is instantly followed by muscular debility.

213. In a prognostic and diagnostic sense, the degree of mus-

cular debility, the duration, constancy, and nature of the same, the accompanying phenomena, the state of the power of sensation, and the extension of the same, establish important distinctions. The degree of muscular debility is directly proportional to the intensity of the disease. Great prostration of strength in acute diseases warrants us in inferring great intensity and disease of some organ important to life. In chronic diseases, gradually increasing prostration is of more unfavourable import than when it rises rapidly in consequence of a complication of disease, especially an inflammatory disease.

214. The longer the muscular prostration has lasted in chronic diseases, the worse is the prognosis. Long duration of debility in acute diseases, before the other signs of the affection set in, is unfavourable; it indicates in general a nervous form of disease. If the muscular prostration appears only in the course of acute diseases, particularly in inflammations, suddenly, without the possibility of discovering any cause for it, the prognosis is unfavourable. A continuance of the debility is more favourable than alternation of it with exaltation of the muscular strength, for then the cause is to be sought in the brain.

If the debility of the patient shew itself rather in rapid exhaustion through muscular exertion, the vascular system is principally diseased. Where the thing, on the contrary, proceeds from the nervous system, the muscular efforts themselves are much slower, and weaker, and almost impossible, and the patient avoids motion, because he can produce it only with great exertion, not because he dreads speedy exhaustion.

215. If the accompanying phenomena, such as fever, the local signs of an inflammation, the signs of a change in the blood, harmonize with muscular debility, this is more favourable than if the latter be present without corresponding signs of the morbid state of other functions or organs. Great muscular debility at the commencement of a fever, without either the latter or the pain or evacuations being considerable, indicates a nervous form of fever. If the muscular debility be connected with delirium and delusions of the senses, it proceeds from the brain; if there be loss of sensation in the weak part, the disease is either in the brain, spinal cord, or the corresponding nerves. Great muscular debility after proportionally small evacuations is a bad sign. In scurvy, chlorosis, and states of amenorrhœa, it is attended with no danger. If the strength does not return during convalescence from diseases, there is reason to dread a

return of the disease, or some after-disease. Muscular debility after hysterical or epileptic attacks, after great bodily exertions, violent evacuations, long continued suppuration, long watching, want of food, does not render the prognosis bad if it only becomes diminished sometime after the cause has ceased. If no debilitating influences have preceded, and the muscular debility has suddenly presented itself, in robust men, hyperæmia of the brain is mostly the cause; this is a part of what is called *oppressio virium*.

216. The feeling of the patient harmonises with muscular debility far more in diseases of the vascular system and blood than in those of the nervous system. In the former, the patients feel even weaker than they really are; whilst in those cases where the debility proceeds from the nervous system, the patient either does not feel at all weakened, or but slightly so, and becomes convinced of his weakness only when he attempts to move. The former case is the more favourable.

217. The debility may be general or extend only to certain muscles and limbs. General debility yields in general a more favourable prospect for recovery than that which is local. The cause of the latter is some affection either of the brain, spinal cord, or some nerve; or a deficiency of nutrition.

218. Impeded motion in rheumatism and in the state similar to this at the commencement of many affections of the nervous system (*vid.* 203,) should be carefully distinguished from muscular debility. Here the patient avoids motion on account of the pain which it causes him, not on account of debility.

219. Voluntary motion is suspended in syncope and apparent death (*vid.* their causes;) except those states, it is a sign of disease of the brain, spinal cord, and their membranes, or of the nerves, (to the latter, palsy from lead and mercury, as that also which occurs in the extreme form of scurvy, seems to belong,) or it is occasioned by disturbance of the circulation, or finally by morbid organic change of the paralyzed part. Paralysis of the organs of voluntary motion has a various prognostic and diagnostic import according to the accompanying phenomena, especially in the paralyzed part, as also according to its extent, course, and duration.

220. If the palsy take place suddenly, and simultaneously with the occurrence of the weak state or cessation of the circulation, disturbance and loss of consciousness, and imperceptible respiration, it is to be ascribed to syncope and its causes. If the commencement of the palsy be accompanied by violent

fever, pain of head, and delirium, meningitis is its cause. Tubercles may be suspected where it occurs in a very chronic form, where tubercles are developed in other organs or the phenomena usual in tuberculosis have manifested themselves. Cancer of the brain is the cause of palsy, where it comes on with lancinating pains and a livid hue of the countenance. If the paralyzed limb has assumed a bluish colour, and has become swollen, pulseless, cold, in which case the principal vein or artery is felt as a thick, hard string, the paralysis is produced by disturbance of the circulation. Paralysis from change of the muscles is easily recognised, but more difficult where the cause lies in the nerves. We may sometimes recognise as such a cause a tumour pressing on the nerves, which may be felt from without.

If signs of a disease of the spinal cord have previously existed, the cause may be sought here, more especially if the paralysis confine itself to the lower extremities, rectum, and bladder.

221. The extent of the muscular paralysis affords the most important data for determining the seat of the disease in question.

General muscular paralysis is always occasioned through a disease of the brain, which affects this organ either in its entire circumference or in the central parts, or only one half of it, but to such extent that the latter acts on the healthy half or the central parts. This disease may be congestion towards the brain, an inflammation of the cerebral membranes, an extravasation of blood which is effused into the ventricles or which compresses the healthy hemispheres, hydrocephalus, an extensive softening of the brain, which acts on the sound half, or there may be tubercle, cancer, or hydatids in the pons Varolii.

222. Local palsies admit of a still more accurate diagnosis as to their seat. Palsies always appear on the side opposite to the diseased half of the brain. Paralysis of an upper extremity mostly depends on disease of the optic thalamus of the opposite side; in paralysis of a lower extremity, when its cause exists in the brain, the corpus striatum of the opposite side is ordinarily the seat of disease. If one side of the body be paralyzed (hemiplegia), the corpus striatum and optic thalamus of the opposite side are the parts affected. If the foot of one side and the arm of the other be paralyzed, both halves of the brain are morbidly changed.

Paralysis of both lower extremities proceeds from some part

of the spinal cord lying beneath the origin of the cervical nerves.

223. A general palsy, when it does not arise from a sudden congestion, or in syncope, is of unfavourable import. In apparent death, it holds out an unfavourable prospect; but still worse where the paralysis takes place with signs of meningitis, extravasation of blood, softening, or after chronic diseases of the brain. The fewer limbs and cerebral parts are affected, the better the case is; accordingly, the paralysis of an extremity is more favourable than hemiplegia, and this again more favourable than decussating paralysis. Paraplegia is, to be sure, slow in progressing, but still it affords an unfavourable prognosis, more especially when the bladder and rectum are at the same time paralyzed. If the cause of the paralysis be disturbance of the circulation in the paralyzed part, the prognosis is bad. If it be pressure on a nerve, or disease of this nerve, the paralysis does not deteriorate the prognosis of the tumour so pressing, or of the disease of the nerve. That occasioned by laceration of the muscles or lead-colic is less dangerous than obstinate. In nervous fevers, hemiplegia and decussating paralysis are a very dangerous sign. If it continue after fever, it is incurable. If a paralyzed extremity become atrophied and cold, the restoration of its power of motion is no longer possible.

224. The course of a paralysis contributes considerably to our ascertaining its diagnostic and prognostic importance. If it set in rapidly, violent congestion of the head, or an effusion of blood into the brain, may be considered as the cause. If it is not much extended or considerable, one may hope for a recovery. If the paralysis increase gradually, cerebral softening is present, and the prognosis is bad. It is very slow in increasing in morbid organizations in the brain. When, on the contrary, the paralysis decreases gradually, the prognosis is favourable; this occurs principally in the case of effusions by their re-absorption, and in cerebral congestions. If the paralysis continue to stand at a certain point, life is out of danger, and a cure has taken place with loss of substance.

225. The duration is short in cerebral congestions, meningitis, effusion, softening; and long, on the other hand, in case of cancer, tubercles of the brain, acephalocysts, tumours which are developed in the dura mater and cranium, and make pressure on the brain.

Signs from the Involuntary Motions.

226. Muscular restlessness (*anxietas extremitatum, tenesmus musculorum*) forms the transition from the voluntary to the involuntary motions, where the patients under the influence of obscure sensations in the extremities, which may rise to a slight feeling of uneasiness, are forced to move the same. This is caused by long severe walking; it is also observed to occur in hysteria and hypochondriasis.

227. Trembling is the next degree of involuntary motion; the muscles cannot find that equilibrium requisite for firm support in the contraction of the muscular fasciculi which antagonize each other. It presents itself under two orders of circumstances—first, under those which excite the feeling of cold or shivering in the body; hence in the cold stage of fever, especially in intermittent fever, in hysteria, hypochondriasis, after severe evacuations, before the transition from one form of disease to the other, through a sudden impression of cold from without. Secondly, through irritation, hyperæmia of the brain, spinal cord, and their membranes. At the commencement of acute diseases it indicates violence of the disease and irritation of the brain; it precedes delirium, convulsions, as those of an epileptic character, and apoplexy. After crises, it is usually combined with great debility of the muscles. It is also produced by the long continued abuse of mercury, by excessive indulgence in alcoholic drinks, opium, coffee, and the abuse of the sexual organs. In acute diseases, when other signs also of cerebral disease are added, it is of unfavourable import.

Trembling of paralyzed limbs often precedes their cure. Trembling of the parts of the head is worse than that of the extremities.

228. In spasms (*convulsio, spasmus*) the voluntary muscles contract involuntarily. The cause of spasm may be referred to irritation, hyperæmia, anæmia, general or partial hypertrophy, inflammation, or softening of the brain or spinal cord, to tumours in the same parts, and to irritation of the ganglionic nerves. The latter cause produces it more particularly in those patients whose nervous system is very sensible to external impressions, and reacts violently on them.

If pathological anatomy has not as yet pointed out any palpable changes in the brain and spinal cord in many cases appertaining to this affection, it depends partly on this cir-

cumstance, that the minuter changes escape us directly in consequence of their minuteness, and because when the entire brain has undergone a change we possess no standard of comparison; partly also on this circumstance, that an anomalous function of an organ is not necessarily followed by an anatomical change in it. If, therefore, physiology and the accompanying phenomena point out this or that organ as the seat of the cause of a sign, the want of anatomical sensible changes in the organ concerned is no proof to the contrary, particularly if the phenomenon is passing off.

229. Thus spasms are occasioned by mere irritation of the brain and spinal cord in violent passion, after injuries of tendons and nerves, by arrow-poison, strychnine, prussic acid, and by violent pains. Spasms are connected with hyperæmia of the brain and spinal cord at the commencement of inflammatory and more especially of exanthematous fever, in cholera, in gastric disturbances, in heart and lung disease, where congestions readily take place towards the head, during parturition, in the dentition of children, in the nervous stages of fever. They occur through an anæmic state in great hæmorrhages, especially after parturition.

Spasms proceed from the ganglionic nerves in case of worms, gastric irritation, the pain of stone, in irritation of the rectum occasioned by foreign bodies in it, in diseases of the spleen. The long continued action of lead and mercury in like manner produces spasms.

Hysterical, epileptic, and cataleptic convulsions, as well as those of St. Vitus' dance, and many cases of tetanus, seem to proceed from the nervous system; the way in which this is affected must be found by further investigation.

230. Spasms are distinguished according to their form, extent, the circumstances under which they set in, and by which they are attended, and lastly according to their duration.

231. The form of the spasm is afforded by its continuance or remission.

The tonic spasm, where the muscles are permanently involuntarily contracted, and where, if many are affected, the body is bent backwards, forwards, or laterally, or is rigidly extended, appertains, if it attack a considerable fasciculus of muscles, to irritation or inflammation of the brain, spinal cord, and their membranes; hence it takes place after injuries of tendons, nerves, after colds, rheumatism, in consequence of arrow-poison, and from irritation connected with softening of the

brain; further, it is a sign of chronic cerebral disease, particularly of cancer of the pons Varolii, of the cerebellum, and of the posterior lobe of the great brain, of apoplexy of the spinal cord, as in apoplectic cholera. These general tonic spasms are called tetanus, and if they remain confined to the muscles which raise the jaw bone, they are called trismus. Catalepsy also comes under the class of tonic spasms. In general, tonic spasms, with the exception of the cataleptic, are much more dangerous than clonic.

232. Clonic spasm, where the contraction alternates with relaxation or with contraction of the muscles, is chiefly incidental to hyperæmia and anæmia of the brain, spinal cord, and their membranes; it also takes place through irritation of these organs, and more especially of the ganglionic nerves.

Spasms are hence clonic in all states where congestions occur towards the head and spinal cord, where the ganglionic nerves of the intestinal canal, bladder, and uterus, are unusually irritated; finally, in poisoning by lead, mercury, strychnine, prussic acid, and in severe losses of blood. They also sometimes accompany softening of the brain. Hysterical and epileptic spasms come under this class.

233. The extension of the spasms over a greater or less number of muscles is of importance with respect to diagnosis and prognosis. Their extension to all the voluntary muscles is observed particularly in catalepsy, epilepsy, hysteria, spasms of the ganglionic system, and in St. Vitus' dance. In the first, all the muscles during the paroxysm appear to be in a tonic spasm, so that they mutually preserve the equilibrium. In St. Vitus' dance, hysteria, &c., there is a clonic spasm which attacks several muscles one after the other; shaking of the entire body comes under this head also; it is a clonic spasm wherein the contractions of all the muscles which antagonize each other follow with extraordinary rapidity. Shaking differs from other clonic general spasms in this respect, that in the latter the muscles of an extremity are seized one after the other, whilst in shaking of the entire body, one half of the muscles constantly alternates with the other in their contractions. In both, the muscles have lost their equilibrium, which is preserved in the tonic general spasm.

In spasms which have seized the entire body, the prognosis is more favourable than where a considerable set of muscles is attacked, because in the former the central parts of the nervous system, at least that part which presides over voluntary motion,

are seized on altogether, and if life continue they may for this reason be involved in only a slight degree of irritation; accordingly, in post mortem examinations of those cases of general spasms, no pathological changes are found capable of accounting for the phenomena, with the exception of hyperæmia and anæmia of the brain and spinal cord.

234. Where, on the contrary, the spasm is confined to a large set of muscles, as the muscles of the spine, all the flexors, &c., we usually find organic changes of some part or other of the brain or spinal cord, especially hyperæmia, traces of inflammation, softening, tubercles, cancer, hydatids, &c.

In softening of the brain, there is a tonic spasm of all the flexors present. Clonic local spasms are frequently a sign of cancer of the brain.

The prognosis of spasms confined to a large set of muscles is unfavourable.

235. Spasms of separate muscles, called *subsultus tendinum*, *floccitatio*, are not dangerous, more especially in children, young persons, or in hysteria, hypochondriasis, except where they present themselves with delirium or somnolency, as in the nervous stage of fever. In such cases, they do not render the prognosis decidedly hopeless, but they indicate great violence of the disease. Spasms of the muscles of the face are much worse than those of the extremities.

236. The circumstances under which spasms take place, and by which they are accompanied, more particularly determine their prognostic value. Spasms in children and in slenderly formed females are less dangerous than in men. At the commencement of acute diseases, especially small-pox, they do not impress an unfavourable character on the prognosis; in the more advanced course of a disease, as in the nervous stage of fever, they are a suspicious sign, more especially if delirium breaks out with the spasms.

Spasms in chronic diseases are bad. If fever set in after spasms, the prognosis is favourable. After injuries of the head, in cases where violent headache and delirium appear at the same time, the prognosis of spasms is unfavourable. During pregnancy they are not so dangerous as during and after parturition. After great loss of blood and profuse diarrhœa, they are an extremely dangerous sign. Spasms combined with cold sweats, or violent internal pains, yield an unfavourable prognosis. Where they proceed from gastric irritation, worms, obstruction, or difficult dentition, they are attended with no danger.

237. The longer the individual paroxysm lasts, the worse the prognosis is, especially in tonic spasms. Chronic spasms proceeding from the brain and spinal cord, that is, those which return from time to time during a number of years, endanger life less immediately than the acute. If, on the contrary, spasm proceeds from the ganglionic nervous system, the first spasmodic attack yields a more favourable prognosis than later attacks. The longer the disease lasts, the less hope is there of being able to cure it. Where the paroxysms return frequently in a given time, the disease is more curable than where the paroxysms are fewer.

SIGNS FROM THE STATES OCCASIONED BY THE ACTIONS OF THE MUSCLES.

Signs from the Features.

238. These are formed by the action of the muscles of the face. (For size and colour of the face, *see* "Skin.") Their changes in diseases more especially indicate the state of the sensitive and intellectual functions, and of the muscular power, when they are not produced by involuntary motions. According to this view, they are distinguished into two forms.

239. A tranquil, steady countenance, expressive of hope, is of favourable import in disease, more especially in patients of weak mind. Only in cases where the other signs indicate a severe disease it is bad; then, when combined with the sudden cessation of pain, it indicates paralysis or gangrene of the diseased organ.

A serene, tranquil countenance, if it follow an indifferent or morose expression of face, precedes delirium or spasms. It often arises from spasm of the muscles which raise the angle of the mouth.

The morose, pcevish countenance is a sign of abdominal diseases. In children, it is observed as a precursor of a number of diseases, especially of an acute form. It frequently precedes delirium.

240. An indifferent countenance is observed in those chronic diseases which are combined with no disturbance of sensation, and in the typhous stage of fever. In the former, it is in other respects natural; it has at the same time undergone a peculiar

change ; the look is fixed, the eyes bright, the lips are tremulous, and covered with a brown coating like the teeth and tongue.

Anxiety produces in the features a characteristic change. At the commencement of acute diseases, the anxious countenance indicates great violence of the same, also great pain, and exaltation of sensation, as in melancholy and hypochondriasis. A peculiar expression of great internal anxiety, and at the same time of resignation, is caused by organic changes of the heart and great vessels.

241. Painful contortion of the face is particularly marked in diseases of the intestinal canal, and of the generative parts, and also of the extremities. It is a peculiarly valuable sign in delirium and in soporose states, as it then often serves as the only means by which the existence of pain is discovered. In a high degree of contortion, where somewhat of despair is blended with the painful expression, as is found to exist in ileus, enteritis, peritonitis, in the softening of the stomach in children, the face is drawn out in length, the nose is elongated, and the look becomes confused. The highest degree of that expression of countenance which indicates pain and despair is in the Asiatic cholera ; here the nose becomes long and pointed, the lips blue, the cheeks sunk, the eye is turned up, so that the pupil is placed under the upper eyelid. The expression of despair is of very bad import.

The countenance in delirium ferox is marked by sudden contractions of the facial muscles, by sparkling, rolling eyes, and by the redness and tension of the skin.

242. The countenance expressive of extreme debility has been thus described by Hippocrates :—*Nasus acutus, oculi cavi, tempora collapsa, aures frigidæ aut collapsæ et extremitates aurium reversæ, cutis circa frontem dura et circumtenta ac arida, color totius faciei pallidus aut etiam niger et lividus et plumbeus.* In acute diseases, the Hippocratic countenance is of more unfavourable import than in chronic. Some of these signs may also present themselves after night watching, great grief, fright, severe evacuations, and may even precede a crisis. The prognosis is worst when at the same time a fine powder is observed on the face, the eyebrows, and the hairs of the nose, and the nostrils are narrowed and fallen in.

243. Jadelot endeavoured to establish characteristic features for the diseases of the three principal cavities of the body. According to him, the fold or wrinkle from the angle of the eye to the highest point of the under jaw indicates diseases of the head ;

that running from the ala nasi in a semicircle around the mouth in the lower jaw indicates diseases of the abdomen; the fold which, commencing from the angle of the mouth, runs downwards, should characterize diseases of the chest and neck.

244. Immobility of the features is a sign of great debility, of general tonic spasm, as in catalepsy, or of loss of consciousness, if it proceed not from stupidity. Increased mobility of the same, and more especially their sudden, irregular changes, are a sign of acute or chronic delirium, (they precede and accompany it,) or of clonic spasm.

245. General tonic spasms of the face are observed in catalepsy; partial tonic spasms of the facial muscles are called trismus; they affect the masseter and temporal muscles, whereby the lower jaw is locked; besides, either the orbicularis oris or orbic. oculi may be affected, whereby the mouth is closed, and the rima between the eyes very much narrowed, or the muscles which antagonize these are seized with spasm, and the eyelids are widely separated, the eyes fixed or distorted and restless, the lips very much drawn back, so that the teeth are exposed. Trismus is a bad sign, and its cessation favourable. It precedes tetanic spasms of the spinal muscles and of the extremities.

Clonic spasms of the facial muscles are very dangerous in acute diseases of the brain; hence, when they present themselves with constant pain of head, with delirium or sopor, the prognosis is unfavourable. When, on the contrary, they are signs of a chronic nervous disease, they do not render the prognosis worse.

SIGNS FROM THE FORM OF THE INDIVIDUAL PARTS OF THE FACE.

Of the Mouth.

246. The form of the mouth, when it is not changed by a morbid affection of the lips, depends on the functions of its muscles. The closing of the mouth is occasioned — 1, by spasm; the cause of which is in general irritation or inflammation of the brain, spinal cord, or their membranes, unless it has the form of epilepsy. This species is distinguished from the others by the simultaneous spasm of the other muscles of the

face. The prognosis is bad where it has not the epileptic form.

2. In the Fothergillian face-ache through disease of the nerve. The patient closes the jaw involuntarily, and grinds the teeth.

3. In morbid growth of the articulation of the jaw, tumours in the vicinity of this articulation, in which case there is no pain, and the lips can be moved voluntarily; or by rheumatism, inflammation of the parotid or maxillary gland, or of the tonsils, and swelling of the cellular tissue of the parotid region. In these cases there is pain, and the patient can separate the jaws from one another.

247. An open state of the mouth, where an imperviousness of the nose, tumours in the mouth, or dislocation of the lower jaw, cannot be admitted as causes, is the consequence of muscular debility or paralysis. Accordingly, the mouth is generally open in the typhous stage of fever, and in apoplexy; and in such cases it is a very bad sign.

Many persons are in the habit of keeping the mouth open, especially idiots; persons hard of hearing do it, in order to hear better.

248. Crookedness of the mouth takes place, where it does not owe its origin to degenerescence of the neighbouring parts, temporarily from spasm, and permanently from paralysis. This spasm (the sardonic grin) proceeds from the brain, or from the ganglionic system. It is very frequent in gastric irritation, worms, in hysteria, hypochondriasis, in St. Vitus' dance, where it portends no danger. But if it occur in inflammations, in the acute exantheams, in typhus, and in the nervous forms of fever, if loss of consciousness and delirium be at the same time present, the prognosis is unfavourable, as the brain is then in a state of irritation or of inflammation.

A crookedness of the mouth from paralysis is the first sign of apoplexy, of effusion into the brain, and of organic diseases of the brain.

For distortion of the mouth by trismus, *see* 245.

Convulsive action of the lips is a clonic spasm, which proceeds mostly from the ganglionic system. The loose dependence of the lips is caused by paralysis, in consequence of apoplexy and effusions into the brain. Tremor of the lower lip is mostly a sign of extreme debility, but it sometimes indicates critical vomiting.

Signs from the Motion of the Eyelids.

250. Closing of the eyelids takes place in intolerance of light, in pain in the eyes, in vertigo, and also from swelling of the eyelids, such as œdema, in small pox. Besides, it is produced by paralysis of the levator, and by spasm of the orbicular muscle. If it be spasm, the eyelids are firmly contracted; it is then a sign of an affection of the brain, and, unless it be of an hysterical character, of unfavourable import, more especially in febrile diseases and chronic affections of the brain.

If paralysis be the cause, the upper eyelid hangs down quite flaccid, and can only be raised by extrinsic aid. It may be purely local, after rheumatism of the levator, or be caused by injury of the frontal region, or abscesses of the eyelids; or it is the consequence of cerebral disease, more especially of apoplexy, hydrocephalus, concussion of the brain, and then brings an unfavourable prognosis.

251. If the eye be half closed, and can still be opened by the patient, great debility may be inferred. Hence this sign is observed to exist before apoplexy, at the commencement of hydrocephalus, in nervous fevers, in gastric irregularity, irritation from worms, in hypochondriacal and hysterical states, after great loss of blood, and in vitiated states of the blood in scurvy and in chlorosis.

252. An open state of the eyelids in sleep, and an inability to close them when awake, is caused either by spasm of the levator (*lagophthalmus spasmodicus*) or paralysis of the orbicularis (*l. paralyticus*). The diagnostic and prognostic import is the same as in morbid closing of the eyelids.

If these anomalies exist only in one eyelid, unless they are caused by rheumatism, injuries, tumours, &c., they indicate spasm or paralysis on one side, and accordingly disease of one cerebral hemisphere, a circumstance which in fevers more especially affords a bad prognosis.

253. Tremor of the eyelids and morbid winking (*nictitatio*) is a clonic spasm which owes its origin to an irritation or inflammation of the brain. Hence it precedes attacks of hysteria, epilepsy, catalepsy, and St. Vitus' dance; it appears in the irritation from worms, in typhus, in prosopalgia, in mental disease; it regularly precedes delirium and convulsions; only in catalepsy it indicates the end of the paroxysm.

Signs from the Motion of the Forehead and Nose.

254. Wrinkling of the forehead indicates, if it take place involuntarily, the commencement of spasms, more especially of tetanic, epileptic, and hysterical spasms. If it take place voluntarily, without any external cause, it precedes delirium, more especially in fevers and mental diseases.

255. Twisting of the nose to one side is a sign of apoplexy. Narrowing of the nostrils by contraction of the *alæ nasi* denotes paralysis of the muscles which dilate the nose, and consequently apoplexy. Violent and rapid movements of the *alæ nasi* are occasioned by dyspnoea; the case is still worse if they no longer move.

Signs from the Gait.

256. The changes of the gait in diseases depend partly on the state of the passive and active organs of motion, and partly on the brain, spinal cord, and state of the blood.

The quick, hasty gait is peculiar to the sanguineous temperament; in disease, it warrants us in inferring an irritated state of the brain; it frequently forebodes acute and chronic delirium.

The laborious, tardy gait, indicates either debility of the muscles, or it arises through disease of the bones and joints, more especially inflammation, exostoses, tumours in the joints, as well as through disease of the muscles by rheumatism, atrophy, &c.

257. A tottering gait is sometimes a bad habit; in other cases, a consequence of atrophy of the head of the thigh bone after hip-disease, of debility of the ligaments, and often of the muscles of the lower extremities. A staggering gait is a consequence of vertigo, and accordingly has the same import, as a sign of disease, as the latter.

The stiff gait, where the joints of the lower extremities are but very little moved, is a sign of tumours in the inguinal region, as for instance, of large herniæ, painful affections in the parts of generation, in the perinæum or rectum, as from chancre, gonorrhœa, inflammation or ulceration of this region or of the bladder. At the commencement of paraplegia, also, patients adopt this gait. If the patient turn his body about as he goes along, ankylosis, paralysis, or spasm, may be the cause. A gait characterized by dragging of the foot is a sign of commencing paraplegia.

The gait with the body bent may be looked on as a sign of muscular debility, and more particularly that proceeding from the brain and spinal cord; it may also be occasioned by diseases of the vertebral column, and of the spinal muscles.

If the patient is affected by tremors in the hands, and nodding of the head, when he walks, this indicates irritation of the cervical part of the spinal cord; it precedes inflammation and tetanic spasms.

258. Inability to walk is either a sign of luxation, fracture of the lower extremities, of rheumatism, or it is produced by great muscular debility, as well as by paralysis.

Signs from the Posture and Attitude of the Body.

259. Inability to stand is either the consequence of local diseases of the lower extremities, more especially of the bones and joints, or of vertigo, as at the commencement of many acute diseases, at the setting in of the nervous stage of fever, before crisis, &c., or the muscles are weak or paralyzed. It proceeds from weakness in a great number of chronic and acute diseases. In chronic affections it is a bad sign, in acute affections it denotes considerable disease, and continues for a long time during convalescence. It is just as bad where paralysis is the cause.

Constant motion in standing is a sign of commencing spasm; hence it precedes tetanus, and St. Vitus' dance. Tremors in standing have the same import as tremors in general.

260. A collapsed and dejected bearing of the body in standing is a sign of fatuity.

Letting the head fall on the breast is either a consequence of muscular debility, and accordingly usual in aged persons, or of disease of the vertebral column. A crooked attitude, so that one shoulder stands deeper than the other, is either occasioned by narrowing of one side of the chest after pleurisy, or is adopted in order to avoid pain. Curvatures of the vertebral column, Pott's disease, and shortening of one extremity, likewise produce a crooked attitude of the body.

261. Inability to lie down, by which the patient is compelled to sit, is occasioned by great difficulty of breathing; it is accordingly a sign of organic changes of the heart, of pulmonary inflammation, of tubercles, of chronic bronchial catarrh, of emphysema, pleurisy, hydrothorax, pneumothorax, asthma, and of the very advanced stage of ascites. In the extreme degree of dyspnoea the patient bends the body forwards, or stretches

the neck back, as in eroup. Sometimes patients are compelled by cerebral congestions to sit, or at least to lie, with the head very much raised.

A quiet position in lying down, with perfect consciousness and considerable strength, is a very favourable sign in diseases. It indicates the termination of the morbid process. If the patient lie quiet in consequence of muscular debility, it denotes the presence of a dangerous disease, as typhus, plague, yellow fever, the acute exantheas, child-bed fever, with debility by violent evacuations. If the quiet position of lying be combined with loss of consciousness, it indicates extravasation of blood or effusion into the brain. In acute rheumatism, the patients lie quiet on account of the pain occasioned by moving.

A restless mode of lying has the same import as restlessness itself, which *see*. It yields an extremely unfavourable prognosis in those diseases wherein the patients usually lie quiet, as in thoracic inflammations and rheumatism.

262. Lying on the back is adopted in case of great debility, and, moreover, in most inflammations of the abdominal organs, in diseases of the brain, in double pneumonia, in the grey hepatisation, in bronchitis, and in most diseases of the heart. In paralysis, and in general rheumatism, the patient in like manner prefers this mode of lying.

Lying on the abdomen ordinarily indicates violent abdominal pains; it may precede delirium. Patients prefer to lie on the left side in organic diseases of the heart, in aneurism of the aorta, in pneumonia and hydrothorax of the left side, as also when considerable pleuritic effusion exists on this side, and the pain has ceased; also in tumours of this side, in pains which are confined to the left side, and are not of a rheumatic nature.

Lying on the right side is observed in pneumonia, hydrothorax, pleuritic effusion into this side of the chest, if the thoracic pains have subsided, in inflammation of the spleen, and psoriasis of the left side.

At the commencement of pleurisy, the patient mostly lies on the back, somewhat inclined towards the affected side; but when the pains have disappeared, and considerable effusion is present, he lies on the affected side.

263. Doubling up of the trunk is an important sign for distinguishing bronchitis from diseases resembling it. In severe abdominal pain, also, the patient adopts this position. Drawing up the thighs towards the abdomen takes place in all inflammatory diseases of that cavity; this is very common in children.

If the patient adopts this position in diseases to which it does not properly belong, as in typhus, child-bed fever, it is a bad sign, inasmuch as it then indicates great severity of the morbid process going on in the abdomen.

The head is inclined to one side in luxation of the cervical vertebræ, wry-neck, a wen on one side, glandular swellings, or tense cicatrices on the side of the neck, in paralysis, spasm, or morbid change in the pronator capitis or splenius capitis, on one side.

IV.

SIGNS FROM THE VASCULAR SYSTEM.

I. FROM THE HEART.

Signs from Percussion of the Cardiac Region.

264. THE obscure sound which the cardiac region yields over the space of from one and a half to two square inches in extent, corresponds with that part of the heart that is uncovered by the lungs. If the lung cover the heart entirely, the distinction between this and the pulmonary sound is inconsiderable, and more especially if the part of the lung concerned be the seat of vesicular emphysema.

This obscure sound may increase in intensity and extent.

265. The sound on percussion is more obscure in hypertrophy of the heart or of some of its parts, and dull in case of liquid effusion into the pericardium.

The further extension of the obscure sound on percussion may amount to five or six square inches; it is a sign of dilatation of the heart, with atrophy, hypertrophy, or normal thickness of its parietes, of simple hypertrophy, considerable accumulation of fat in the heart, and lastly of fluid effusion into the pericardium.

Percussion is also important for ascertaining the changes in the situation of the heart.*

* The examination of the heart, as well as that of most organs, rests on two orders of phenomena, the one giving rise to anatomical, the other to physiological signs. The cardiac region may be explored by inspection, palpation, percussion, and auscultation.

Inspection. On inspecting the thorax, the sternum and ribs which correspond to the two first pieces of this bone are sometimes observed to present a protuberant appearance. This may depend on original for-

266. In the normal state, the heart's impulse is felt between the fourth and seventh costal cartilages of the left side, sometimes also at the inferior half of the sternum, or at the epigastrium if the sternum be short. It consists in a slight shock, which sometimes raises the parietes of the chest, sometimes can scarcely be felt except with the stethoscope. The heart's impulse coincides

with the pulsation. Sometimes it is occasioned by deviation of the vertebral column, whence the necessity of examining the vertebral column before forming our diagnosis. When the protuberance of the sternum and of the thoracic wall to the left of this bone appear to be independent of these causes, it is often dependent on effusion into the pericardium; in such a case, the corresponding intercostal spaces are observed to be dilated.

The ribs and sternum are often raised by the motions of the heart. This is more obvious in those parts of the chest where the apex of the heart strikes the ribs. This elevation of the parietes of the chest may be influenced by so many other causes, independent of heart disease, that we can derive but little aid in our diagnosis from this phenomenon.

When examining the heart by palpation, or touch, the hand of the physician may be placed either immediately on the patient's skin, or some light covering may be interposed; the hand, being first warmed, is to be placed flat on the parietes, with sufficient force, the patient being placed alternately lying on his back and in the sitting posture; the parts to which the hand is to be applied being (1) the point corresponding to the apex of the heart; (2) the sternum; (3) the epigastrium. By palpation, we are enabled to judge of the strength with which the heart acts. If the hand be raised with force, and over a limited space, in a subject of middling stature, we may infer that the organ is strong, and of ordinary size; if, on the contrary, the sensation of the elevation of the ribs be felt over a considerable extent, the heart is large and strong. If the pulsations be imperceptible, (in a subject of a moderately developed chest,) the organ is weak.

There are certain sensations afforded by placing the hand on the cardiac region which may be noticed here: (1) the *fremissement cataire*, or purring sound, which in many cases corresponds with contractions at the orifices of the heart; (2) a sort of vermicular movement felt in very feeble subjects either after loss of blood or in the last struggle; (3) a very hard tilt of the apex of the heart against the parietes, which causes an unpleasant sensation, and is observed in certain individuals with meagre chests. This same shock is found at intervals in persons subject to nervous palpitations. Palpation may be practised mediately; that is, a stethoscope, or any other solid body, may be placed by one of its extremities over the cardiac region, whilst the hand of the examiner may be placed on its other extremity; this will convey to him the sensation of the heart's motions. In this way the impulsion, or the degree of force with which the heart contracts, may be perceived.

When we would wish to form, by means of percussion, an accurate idea of the state of the heart, we must first examine the stature of the subject, the development of the chest from side to side, and from before

with the first sound of the heart, and is produced by systole of the ventricles.

It becomes changed in disease with respect to its strength, character, extent, and in its relation, as to time, to the sounds of the heart.

267. The strength of the impulse is directly proportioned to

backwards, holding in recollection that a capacious chest contains a voluminous heart.

Men who have large muscles have in general the heart large without there being any disease, and vice versa.

A large heart in a small chest and a meagre subject almost always gives rise to morbid symptoms.

The principal results of percussion are the following :—

1. In the normal state, the space over which the heart is in contact with the parietes of the chest is in general from 20 to 24 lines in extent, both vertically and transversely.

2. The heart usually extends from one inch and a half to two inches to the left beyond the space where it is in contact with the parietes, and is there covered by a portion of lung of variable thickness ; it is only by strong percussion that we can succeed in detecting the points where it ceases to lie immediately beneath the parietes. In the vertical direction, the heart does not extend more than from half an inch to an inch above the place where it commences to be covered by the lung, so that the vertical dimension of this organ is a little less than its transversal.

The average transverse diameter is about four inches. The distance of the heart from the clavicle is in general from three to three and a half inches from the clavicle ; but in case of the viscera being pressed from below upwards, as also in case of enlargement of the heart, this distance is sometimes diminished by one or two inches.

In order to examine the heart, it is first necessary to percuss the right lung anteriorly, to endeavour to trace the superior edge of the liver, and to follow up the investigation towards the left, by which means we soon find the right cavities, then the left.

In those cases where the liver extends on the left below the heart, we succeed through the modifications which the sound of those organs presents in determining the points where these parts are in contact. The liver is more hard and dull, and retains somewhat of the sound of the intestines situate beneath it ; whilst the heart is softer, and the sonorousness which it yields retains somewhat of the resonance of the lungs which surround it.

In the abnormal state, the results of percussion vary according to the kind of lesion existing in the heart.

In hypertrophy, there is more marked resistance to the finger, and a very obscure sound over the points of the chest which correspond to the heart ; these phenomena are principally evident when the organ is thick and its cavities little enlarged. If the hypertrophy is considerable, the dull sound will be found over a very great extent.

In dilatation of the heart, there will be less resistance to the finger,

the thickness of the heart's parietes. Its increase is accordingly a characteristic sign of hypertrophy of one or both ventricles; it is, however, likewise increased by corporeal exertions and mental excitement, but only temporarily. Hence, in examining a patient with heart disease, the examination should be conducted when he is perfectly calm and tranquil both in body and

and the space where the dull sound will take place will be more extensive.

If the heart is at the same time dilated and thickened, there will be at the same time great extent in the dull sound, and manifest resistance to the finger.

If the dilatation take place chiefly on the left side, it is on the left side the dulness of sound will be observed.

If the dilatation take place on the right, the dulness will be heard chiefly on this side. Then, and more especially when the right auricle is principally dilated, there is observed under the sternum, and chiefly on the right and superiorly, a marked dulness, which is not accompanied by resistance to the finger.

The extent of the surface where these symptoms are found indicates exactly the degree of the dimension of the cavities concerned.

If blood-letting be performed, the space over which the dulness of sound extends becomes less; and if the cause which obstructs the passage of the blood through the vessels of the lungs continue to act, the same phenomena are soon reproduced.

If the pericardium contain much liquid, a marked dulness is found superiorly beneath the two first pieces of the sternum, and extends beneath the region of the heart. The breadth of the space where it is observed increases according as we examine lower down, and the form of the place which is the seat of the dull sound is somewhat pyriform.

In the case where a moderate quantity of liquid is contained in the pericardium, it is found towards the lower points of the space occupied by the latter, by making the patient lie on the side corresponding to that examined. Thus, in placing him on the right side, it is on the point of the chest corresponding to the right edge of the upper part of the sternum that we must look for the dull sound; whilst in placing him on the left side, it is on the left edge of the sternum on a level with the first four ribs that dull sound of the liquid is observed.

Another fact no less worthy of note than the preceding, to distinguish, by percussion, hydropericarditis from dilatation of the right cavities, is, that in the former, when the liquid rises sufficiently high to cause percussion of the upper part of the sternum to produce a dull sound, this dulness always occurs as much on the left as on the right, and beyond the space corresponding to the sternum; the situation of the pericardium around the great vessels which arise from the heart accounts for this fact. In dilatation of the right cavities of the heart, on the contrary, it is chiefly to the right of the two upper pieces of the sternum, or at least under the right portion of this bone, that the dulness of sound is observable.—*Piorry*, vol. 1.—*Translator*.

mind. The purely dynamic cause, exaltation of action, is readily distinguished from the organic cause, hypertrophy of one or more ventricles, by means of the pulse, which in the former case is very frequent, and not so in hypertrophy.

The diminution of the force of the impulse is observed (1) if the heart's natural stimulus, the blood, does not act on the organ with its usual strength, as after loss of blood and profuse evacuations; (2) if the heart is overloaded with blood in consequence of disturbance of the lesser circulation, as in great dyspnoea, in pulmonary diseases, and in asthma; (3) in case of thin parietes of the organ.

The diminution of intensity when the patient lies on his back, whilst it is more considerable when he projects the trunk forward, may be considered as a characteristic sign of fluid effusion into the pericardium.*

268. The impulse presents several varieties with respect to its quality. A short, abrupt, rapid stroke characterizes thin parietes, and a long, protracted, heaving impulse indicates thick parietes.

A peculiar modification sometimes marks the heart's impulse, which appears to the finger undulating, as if propagated through a fluid. This indicates a fluid effusion into the pericardium.

A further change is the purring sound, (*fremissement cataire*.) It is a peculiar vibration, such as is felt on stroking the head of a cat. It has one and the same cause as the bellows, the file, and the saw sounds—namely, narrowing of the valves of the heart, or a want of proportion between the ventricles and the aorta or pulmonary artery. However, it is not always directly proportioned to the above anomalous sounds of the heart; it may be present by itself without those, or be even absent when those

* According to M. Piorry, the *heart's impulsion* cannot be considered as a stethoscopic symptom, it being connected rather with palpation. Laennec and several other pathologists maintain the opinion that the force of the impulse is proportioned to the thickness of the heart's parietes, a strong impulse denoting a thickened heart, and a weak one the contrary. M. Piorry states that, in his experience at the Salpêtrière, he has examined the hearts of several aged women, in whom, though the heart was much thickened, the impulse was frequently observed to be almost imperceptible; so that he is inclined to consider the impulse of the heart rather an indication of the force of the blow than of the thickness of the parietes. He illustrates this opinion by reference to the state of an hysterical female, in whom nothing can exceed the energetic contraction of her attenuated muscles when under excitement.—*Trans.*

are present. A certain energy of the heart, or hypertrophy of the ventricles, appears to be necessary for the production of this phenomenon. The purring sound is generally observed on the left side of the heart, but it may extend over the entire præcordial region, and even over a considerable portion of the anterior wall of the chest. In order to observe it, the hand must be pressed over the part with tolerable force. A similar phenomenon is observed in the arteries, as we shall presently see.

269. The extent of the impulse is increased (1) in dilatation of the heart; (2) in simple or eccentric hypertrophy—in concentric hypertrophy it is confined to a small space; (3) when the stroke of the heart is conducted through dense bodies, as, for instance, hepatized lungs, through pleuritic effusions, morbid growths, effusions into the pericardium, &c. In adhesion of the pericardium to the heart, all the parts of the heart connected with the former are put in motion. In many of the above cases, the stroke of the heart is felt under the clavicles, even under the right, and sometimes even at the spine.

270. The heart's impulse coincides as to time with the first sound of the heart. There is sometimes an impulse connected with the second sound, but it is more tremulous and much weaker than the first, (back stroke of Dr. Hope.) It appears connected with a high degree of hypertrophy with dilatation. In some rare cases, three impulsions of the heart have been observed during one contraction of the organ.

Signs from the Sounds of the Heart.

271. The normal sounds of the heart vary according to extent, strength, tone, and the relation of each to the other with respect to time.

The extension of the sounds of the heart over the first costal cartilages, and on the left side, as far as half way between the mamma and the clavicle, is still within the limits of health, especially in children and adults with narrow chests, and in lean persons. In children and women, the extension of the sounds of the heart appears to be more considerable, because in them the cavities of the heart are wider in proportion to the body, and the parietes of the organ thinner.

The morbid extension of the sounds of the heart is produced by three causes:—

(1.) Increase of the heart's action. This cause is recognised by the quick pulse, and by its continuing only for a time.

(2.) Deposition of a dense body in the vicinity of the heart, such as hepatization of the lungs, a pleuritic effusion, tubercles, the thickened edges of a tuberculous cavity.

(3.) Dilatation of the cavities of the heart. In simple hypertrophy, the sounds of the heart may be heard even to a greater extent; not so in the concentric hypertrophy.

This extension is observable in the merely functionally increased action of the heart in a certain determinate order,—first, under the left clavicle, then under the right, then on the left side of the spine, and lastly, when at its extreme degree, on the right.

In the same order also the intensity of the heart's sounds diminishes. Deviations from this rule indicate the presence of an organic disease of the heart, or of a good conductor of sound. If it be as strong in an anomalous place, or even stronger than in the præcordial region, dilatation is present. This will be moderate, when the sounds of the heart are heard with equal clearness over all the anterior part of the chest.

272. The strength of the sounds of the heart is diminished in hypertrophy of the ventricles, and in effusions into the pericardium. In fat persons, these sounds are heard to be weaker also than in lean persons. If the intensity of the sounds of the heart be increased in the erect position of the body, and where it is bent forwards, and be diminished when the patient lies on his back, there is a fluid effusion into the pericardium.

The intensity of the sounds of the heart is increased in atrophy of the heart. An inequality in the strength of the sounds of the heart in various contractions of the organ depends partly on merely functional disturbances, and partly on organic disease, as degenerescence of the valves.

273. The tone of the heart's sounds, more especially of the first, becomes clearer in atrophy and duller in hypertrophy; the first sound may, in the latter disease, when advanced, sink down to a murmur, and the second may entirely disappear, or become audible in other places than the cardiac region. If the first sound is clearer, and at the same time shorter, than the second, eccentric atrophy is present; if it be clearer than usual, without reaching the second in clearness of tone, the presence of somewhat thin parietes may be inferred. The tone of the heart's sounds is dry in thickening and rigidity of the valves of the heart, particularly on the left side of the heart; it is rough in a fungous, tumid, but flaccid state of the valves.

274. The relation of the separate contractions of the heart to

each other with respect to time is disturbed in the intermitting pulse-stroke; in old persons it is very common without any organic change of the heart. Under other circumstances, these intermissions are caused commonly by dilatation of the heart, or by dynamic affections, the same as produce palpitations of the heart. They are divided into true and false; in the latter there is a very weak contraction, which, however, produces no pulse-stroke. The relation of the individual sounds of the heart to each other with respect to time may become changed in many ways in disease. The first is shorter, or of equal length with the second, in atrophy of the ventricles. The first sound of the heart is on the contrary longer, gradually increasing, until it strikes on the ear, in hypertrophy; the second follows either immediately, so that it seems to interrupt the first, or it ceases, and is as it were swallowed up by the first. If the hypertrophy be still inconsiderable, the second pause is long; but if it has attained a higher degree, the sounds of the heart follow with extraordinary rapidity. Shortening of the pause occurs in all acceleration of the heart's movements, and prolongation of it in retardation of the same.

A peculiar species of irregularity is that wherein two, three, or even four second sounds follow the first.

275. The anomalous pathological sounds of the heart are divided, according to their character and diagnostic import, into three classes,—the bellows-sound, the rough file and saw sound, and that resembling the rubbing of paper or the creaking of new leather. They may be combined with each of the normal sounds or with both, or even altogether occupy their place. They most frequently appear with the systole of the ventricles. Their intensity is very various; they, more especially the rough sounds, are often heard at a distance from the situation of the heart. The two first named sometimes extend to the arteries.

276. The bellows-sound (*bruit de soufflet*) is similar to the puffing of a pair of bellows, and is distinguished by its softness from the rough sound of the heart. It is found to exist in fibrous or cartilaginous degenerescences of the valves,* which produce

* M. Piorry will not admit that the *bruit de soufflet* is a sign of diseased valves; he has frequently heard the sound where no disease whatever of the heart existed, and vice versa. Dr. Corrigan attributed the *bruit de soufflet*, in certain cases, to insufficiency of the valves, and permanent patency of the aorta; in which case the *bruit* is double, not only at the heart, but also in the aorta.—*Trans.*

some slight narrowing of the openings of the heart ; in narrowing of the aortic opening without the valves being morbidly changed, when there is some insufficiency in the valves of the heart ; in polypose concretions in the ventricles ; also in moderate hypertrophy of the left ventricle with dilatation, but only when the heart is excited ; lastly, in weak hysterical patients, in chlorotic females, and in case of anæmia. The musical sound (*sifflement, sonus musicalis*) is only a modification of the bellows-sound, occurs under the same circumstances as the latter, and appears to take on this form only through a higher tone of sound. The whining sound of Puchelt appears also to belong to this class ; it was heard instead of the second sound of the heart in dilatation and ossification of the aorta, combined with hypertrophy of the left ventricle. The bellows-sound, if it arise from plethora, is often removed by venesection, and again, in case of anæmia, by stopping the discharge of blood, and increasing the formation of that fluid.

If it be permanent in a case, if there be none of the above-mentioned merely dynamic causes present, as chlorosis, &c., if it continue in spite of blood-letting, &c., and especially if it be somewhat like the rough sounds, it must be admitted that it was caused by organic disease of the heart.

277. The rough accidental sounds of the heart, the saw, file, and rasp sounds, (*bruit de scie, de lime, de rape,*) are always signs of organic changes of the heart's openings, of considerable narrowing or want of closing of the same. If the more inconsiderable grades of these changes produce the bellows sound, the rough sounds appertain to the more considerable, more especially to ossifications of the valves. In the extreme grades of narrowing, no accidental sounds are any longer heard.

If they accompany the first sound of the heart, they are a sign of narrowing of the arterial openings, or of incapability to close the auriculo-ventricular openings ; if they coincide with the second sound of the heart, the arterial openings are incapable of being closed, or the auriculo-ventricular openings are narrowed. The further distinction is afforded in this, that they manifest themselves on the right or left half of the præcordial region more intensely or even exclusively there. They always yield an unfavourable prognosis.

278. The rubbing and creaking sounds, which have been compared to the sound of rubbed parchment and the creaking of new leather, (*bruit de cuir neuf,*) are characteristic signs of pericarditis. They manifest themselves in the systole and dias-

stole of the ventricles, and are analogous to the rubbing sound observable in pleuritis. In the slight rubbing sound, the pericardium appears to be nearly dry; on the contrary, in order to the production of the stronger sound, which is frequently similar to the saw sound, as well as to the creaking sound, the existence of false membranes is necessary.

The stronger saw-like rubbing sound is distinguished from the saw sound by its being superficial. Similar is the scratching sound (*râclement*) which is occasioned by the rubbing of cartilaginous, bony, or calcareous parts against the pericardium.

The metallic clink, in strong impulsion of the heart, appears to be occasioned by the action of the latter on the applied ear.

Signs from Palpitation of the Heart.

279. Among palpitations of the heart is included the patient's feeling of the motions of his own heart. He has this feeling, not only in the cardiac region, but often also on the right side, and in the epigastrium. Sometimes he hears the impulses of the heart, and even the sounds of the heart.

Palpitation of the heart is founded on increased action of the heart. This depends on hypertrophy of the muscular substance of the heart, with and without dilatation, or on irritation of the heart. It is irritated to increased action by obstructions in the circulation, by acceleration of the lesser and greater circulation, and from the nervous system.

280. Among the obstructions in the circulation may be particularly classed eccentric atrophy of the heart, ossifications of the heart, valvular diseases, adhesion of the heart to the pericardium, effusion into the pericardium, openings in the septum of the atria or ventricles, polypi of the heart, obstructions in the aorta; also all diseases which rapidly disturb the lesser circulation, as hepatization of the lungs, extended bronchitis, hydrothorax, pleurisy, pneumothorax, asthma, laryngitis. Tumours which become developed in the abdomen, as ascites, pregnancy, degenerescences of the liver, spleen, or ovary, may also be numbered here, as they act partly by obstructing the diaphragm, partly by pressing on the aorta, and thereby disturbing the circulation.

By accelerating the small and great circulation, palpitations seem to take place in frequent respiration without the lung being impervious, in case of violent muscular exertions, clonic spasms, in fever, and in case of anæmia, and in chlorosis.

Palpitation of the heart in affections of the mind, in hysteria, hypochondriasis, and in worm irritation, is purely nervous. Nervous palpitations are intermittent, occur in the midst of a tranquil state with little or no exciting cause, frequently after eating, and are removed by bodily motion rather than made worse.

These different species are distinguished according to the accompanying signs, particularly those afforded by auscultation and percussion of the heart.*

** Physiological or Functional Signs of Heart Disease.*

1. Difficulty of breathing, which may vary from the slightest dyspnœa to orthopnœa.
2. Pulmonary congestions.
3. Hæmorrhages from the nose, bronchi, or lungs; mucous congestions of the bronchi; asphyxia by bronchial mucus.
4. Œdema of the upper or lower extremities; hydrothorax; ascites.
5. Cerebral congestion; cerebral hæmorrhage.
6. Difficulty of breathing when ascending a height, and from exertion, startings during sleep; a peculiar appearance of the countenance, wherein the cheeks are of a violet colour, the lips swollen, the nose large, the eyes bright, and the face puffed.

Practical Circumstances to be considered in exploring Diseases of the Heart.

The causes which have occasioned an affection of the heart may throw some light on its nature; thus, the circumstance of the father having laboured under some particular heart disease may give reason to apprehend that the son will be affected with the same disease.

With respect to *age*, the affections of the heart during the first periods of life are generally attributable to congenital lesions, whilst in the aged person it is from ossifications, or diseases of the bronchi or lungs, they take their rise; contractions are frequently of a fibrous or cartilaginous nature in infancy, and osseous or cartaceous at the advanced period of life; there are less stethoscopic sounds in the aged person, when the same degrees of contraction exist, from the diminished energy with which the heart contracts in such a person.

Young girls are subject to palpitations, which the physician should be cautious in pronouncing to be the result of organic lesion; such symptoms are generally removed on the appearance of the menses.

Robust persons, if they lead a sedentary life, and are highly fed, are liable to certain symptoms of cardiac affection which will be removed temporarily by blood-letting, but which at some subsequent period may be followed by hypertrophy. Persons with thin, long limbs, and contracted chest, are subject to palpitations connected either with the length of their limbs and the distance to which the heart has to send the blood, or with the cold state of this fluid from the great way it has to pass

through. A person who has a large abdomen which presses the viscera upwards experiences very many of the symptoms of heart disease, without, however, any organic disease of the organ really existing.

Insufficient nourishment, by the want of blood which it occasions, produces palpitations connected with anæmia.

Persons who carry heavy loads, make great muscular exertion, or scale ladders, are more liable to cardiac affections than others.

The manner in which cardiac affections first set in may throw some light on their diagnosis. Thus, if the attack be sudden, an acute affection may be the source of the evil. If there be at first rupture or distension of muscles, followed by acute pains in the region of the heart, we may suspect that the fleshy fibres of the organ are affected. If a rheumatic inflammation has preceded the attack, the pericardium is probably the seat of disease. If a pain of side with hæmoptysis has preceded the cardiac attack, the right side of the heart is affected in consequence of the pulmonary circulation being disturbed. Again, if the onset of the disease has been marked with very slight symptoms, which have slowly and gradually increased, there is reason for apprehending that some organic lesion exists; this will be more certain if the symptoms go on uninterrupted, if they constantly increase in severity, and are in time joined by others.

Special and Comparative Diagnosis of Affections of the Heart.

Congestion of the Heart.—By this is understood a momentary increase in the size of the heart or of its cavities in consequence of hyperæmia, or of any obstruction to the circulation by material causes. In this affection there are very marked disturbances of the circulation and respiration, extensive dulness on percussion; under the influence of blood-letting, the heart is found to diminish considerably in size, as may be ascertained by percussion.

Carditis.—Distinguished into *endocarditis*, where the internal membrane is concerned; *carditis* (properly so called) when the muscular fibres which enter into its structure are affected; and *pericarditis* when the external membrane, or pericardium, is affected.

a. *Endocarditis.*—Pain seldom observed; a feeling of distress or tightness in the præcordial region; pulsations of the heart more apparent than usual, and over a great extent of surface; considerable modifications in the rhythm of the heart's actions, and tumultuous pulsations joined either to smallness and considerable frequency of the pulse, or to orthopnoea and coldness of the extremities. Febrile reaction; sometimes less arterial beats than pulsations of the heart. Disturbance in the general venous circulation; acute œdema of the extremities or face. The course of the disease, its invasion succeeding a rheumatic attack, may assist in recognising this affection.

b. *Carditis.*—When an acute pain of recent origin has its seat precisely on the point where percussion finds the heart, and nowhere else, and no signs of pericarditis are present, we may suspect the presence of earditis, more especially when these symptoms have been preceded by muscular pains.

c. *Pericarditis.*—Pain, sometimes none, sometimes very severe; this

pain may be pungent, lancinating, &c.; it is increased by percussion, especially when performed rudely. Pressure from below upwards increases the pain. In acute and general pericarditis, the pain extends upwards towards the mediastinum, and towards the points which correspond to the large vessels surrounded by the pericardium. When the effusion is moderate, the dulness on *percussion* is rather vertical than transverse; this dulness is displaced by the patient changing his position, but only in a space included between the points which correspond to the pericardium, so that in lying on the right side it is on the right edge of the sternum, and in lying on the left side outside the left side of this bone, that the dulness is heard. Auscultation detects (1) the bruit de cuir neuf, attributed to the deposition of pseudo-membranous layers on the pericardium; (2) the bruit de souffle.

Hypertrophy of the Heart.—This is seldom a primary disease. The organic cause of it should be first investigated; as for instance, whether a large abdomen presses up the diaphragm, whether the aorta is compressed by any cause, whether there is contraction of the orifices, adhesion of the pericardium, &c. *Inspection* detects the pulsations of the heart very strong, and diffused over a great extent; the apex of the heart is seen to raise the ribs more on the left and lower down than usual. Enormously large hearts, however, chiefly in aged persons, give no pulsation appreciable externally. The space where the dull sound is heard on *percussion* passes the measures observed in the normal state of the heart by one or more inches. *It is from side to side the development chiefly occurs.* There is, however, some vertical development also. *The form which percussion assigns to the heart, is rounded.* If there be thickness in the parietes over the points where the organ touches the ribs, there is a marked resistance to the finger. This chiefly occurs in concentric hypertrophy. *Auscultation* finds the first sound of the heart dull and prolonged. The extent over which it is heard corresponds sometimes with its dimensions, more frequently however with its energy. The stethoscopic impulsion is sometimes strong in hypertrophy; a souffle is sometimes heard. There is a feeling of straitness, weight, and oppression, in the præcordial region and in the epigastrium, especially when the patient is in the erect posture. With respect to the *pulse*, it is sometimes found soft, weak, and even small, in old men, with simple ventricular hypertrophy of the left side; in the adult, however, it is generally full, strong, vibrating, and regular; face flushed; frequency of pulmonary and even of cerebral hæmorrhages; bright eye; heat of skin.

Dilatation of the Heart.—This may exist separately; it is, however, more frequently combined with hypertrophy; its anatomical characters resemble very much those of hypertrophy. The chief distinguishing characters are, the pulsations are less marked to the sight and touch; percussion detects great volume in the heart; the form of the organ is very round; no resistance to the finger; under the influence of bleeding, the organ often diminishes; if the dilatation be on the right, we find dulness without resistance to the finger, which extends so much nearer to the right mamma according as the organ is increased in size. When the right auricle is dilated, it frequently ascends very high towards the sternum, and nearly to the neck. This state might be confounded with the dulness produced by hydropericarditis, but the form of the space occu-

ped by this dulness is not the same, and never extends to the left. In simple dilatation, the extent of the chest over which the sounds of the heart are heard is greater; these sounds are clear in proportion to the attenuation of the parietes of the organ; this is Laennec's account. If the dilatation be on the right, it is principally under the sternum they are perceived. Reflux by the jugulars often coincides with dilatation of the right side of the heart; the same may be said of pulmonary and encephalic congestions, and of the functional symptoms connected with them.

Cardiactie.—Contraction of the heart or its orifices. The constant existence of hypertrophy or dilatation may lead to the suspicion of narrowing of the heart's orifices; the fremissement cataire is observed to exist in extreme cases; very frequent characters of this affection are the file, saw, and other such sounds. Pulse very small, irregular, weak, and not proportioned to the volume of the heart. Habitual dilatation of the venous system; varices of the extremities; development of the right cavities of the heart; external jugulars enlarged and pulsating. If we empty them by pressing from above downwards, and prevent by pressure the blood from coming from above, we soon see the liquid return from below upwards, which proves the difficulty which the circulation experiences either in the right side of the heart or in the large veins; pulmonary congestion; œdema of the lung; general œdema; ascites; hydrothorax; œdema of the extremities; subcutaneous hæmorrhages; cerebral congestions. All these secondary effects are characterized by their respective symptoms of dyspnœa, orthopnœa, cough, debility, difficulty in walking and in going up an ascent, face swollen, bluish, lips large, eyes watery, frightful dreams, startings in sleep. The combination of these symptoms with the sounds already mentioned leave scarcely a doubt of the existence of contraction at the orifices of the heart.

Several circumstances may throw light on the nature of these contractions of the heart. If their signs quickly follow endocarditis, or rheumatism, we may believe in the existence of false membranes, or thickening of the valves. When the symptoms are congenital, and the subject young, we may suppose that there are merely alterations in the form of the valves, or that fibrous productions are formed; in old persons, on the contrary, when the disease increases gradually, osseous concretions, or cartilaginous indurations, are generally discovered.—*Trans.*

II. SIGNS FROM THE ARTERIES.

Signs from the Sounds of the Arteries.

281. In the normal state, there is heard at every systole of the ventricles a weak, dull sound, which presents various modifications, according to the thickness of the arterial parietes, the degree of fulness of the arteries, and the quality of the blood. If the arteries are thin, not full, and the blood is more watery

than in the healthy state, the tone of the sound is clearer, and approximates to the bellows-sound.

It is a simple, not a double sound, which ceases with the termination of the systole of the ventricles; in the arteries more remote from the heart it immediately follows this. If the artery be pressed, the bellows-sound is produced.

The cause of this sound is the friction of the blood-wave against the parietes of the artery at every stroke.

282. In morbid states, two species of anomalous sounds of the arteries are distinguished:—

1. The simple or intermitting bellows-sound occurs in consequence of the pressure of tumours on arteries, in aneurisms, in the varix aneurismaticus, in ossification and cartilaginous formations on certain parts of arteries, in acceleration of the circulation, more especially in chlorotic subjects, and in individuals whose blood is impoverished. It accordingly depends on the increase of friction of the blood against the arterial parietes. This sound is isochronous with the termination of the systole of the ventricles, and therefore with the pulse-stroke. It is sibilous, and varies very much in strength.

2. The double or continuous bellows-sound, (*bruit de soufflet continu ou a double courant.*) This consists of two, the first of which is the stronger. If the tone is higher, it is called *bruit de diable*; sometimes this whizzing sound becomes piping, like the wind, or rumbling.

These double bellows-sounds are heard chiefly in the carotid and subclavian arteries, seldom in both with equal strength. The position of the head, pressure on the artery, pressing away the larynx from the carotid, produce manifold changes in these sounds, and cause them to disappear.

This sound passes through various modifications into the musical whistling of the arteries, which some have set down as a peculiar species of arterial sound. It is also continuous, the tone becomes higher and louder in the systole of the ventricles; sometimes it is more sibilous, sometimes shrill or buzzing.

All these continuous sounds of the arteries are combined in the watery state of the blood, such as it exists in chlorosis, in weak, pale men, and after severe losses of blood.

Signs from the Pulsations in the Neck.

283. These proceed either from the carotid artery or jugular vein. In the former case, they occur in three ways,—either

through the strong impulse which the heart impresses on the blood, and accordingly in hypertrophy of the left ventricle; or the cause lies in the carotid itself, if it be aneurismatic, or if a tumour is situate on it; or, finally, the cause of the pulsations of the carotid is a state of irritation or inflammation of the brain, as hydrocephalus. In the latter case, apoplexy and delirium are to be apprehended.

The pulsations which a scrofulous tumour occasions also come under this head.

284. The pulsations of the jugular vein (*pulsus venosus*) are further back than those of the carotid. They are occasioned by the impeded return of the blood from the head to the heart, whether in consequence of the vena cava being compressed by tumours, as for instance by an aneurism of the aorta, or in consequence of narrowing of the orifices on the right side of the heart. If the venous pulse be simultaneous with the first sound of the heart, it is produced by hypertrophy of the right ventricle.

Signs from the Pulsations of the Abdomen.

285. These pulsations, which are observed most frequently in the epigastric region, may depend on the heart itself, the great arteries of the abdomen, the inferior cava, or on an increased action of the abdominal vascular system.

They arise immediately from the heart in violent contractions of this organ, in cases of excitement, and more especially in hypertrophy of the right ventricle; also, if tumours press down the heart, or, being placed beneath the heart, propagate its impulsion; lastly, if the pericardium adhere to the heart. This latter case is distinguished by the epigastrium being drawn back at every systole of the heart, and propelled forward at the diastole.

286. The phenomenon may proceed from the large arteries of the abdomen if they be aneurismatic, as the aorta and cœliac artery in particular, or inflamed, as in aortitis, or if tumours are situate on them. These tumours may consist of morbid structures in the neighbouring organs, or may be occasioned by accumulated fæces, or by tape-worm, &c., in the transverse colon.

If the pulsation proceed from the inferior cava, the cause lies in organic changes of the right side of the heart, more especially in narrowing or inability to close the right ostium venosum, dilatation of the right vestibule, or narrowing of the right arterial opening. It commonly happens that several of these changes

co-exist at the same time. The *pulsus venosus* in the neck is very frequently combined with it. A more rare case, which also belongs to this head, is the inosculation of the inferior cava with the right ventricle.

287. This phenomenon appears to depend on increased vascular action in the abdomen, and on plethora; it occurs in many cases of hysteria and hypochondriasis, in gastric fevers, in diarrhœa, and hæmorrhoids. The abdominal pulsation in these cases precedes hæmorrhages from the nose, stomach, and bowels, which sometimes have a critical import, sometimes not.

*Signs from the Pulse.**

288. In judging of the pulse, it is necessary to take into account its several varieties, depending on age, sex, temperament,

* In examining the pulse, the patient should be made to sit or lie down, the pulse being quicker in the standing than in the horizontal position. The patient's arm should not be either too much raised or too much depressed, as these variations of position very much influence the force of the pulse. The fingers of the physician should not be applied when very cold. And care should be taken that no ligature or pressure exist between the heart and the point of the vessel examined. With respect to the force with which the fingers should press the artery, it may be laid down as a general rule, that sufficient pressure should be made to enable the physician to feel the beats of the artery, however deep they may be, yet not so forcible as to obliterate the pulse, even though weak.

In general, the examination should last for a sufficient length of time, for at the commencement the patients are so excited as to modify the pulse.

With respect to the variations of the pulse occasioned by age, the following proportions are in general admitted between the number of years and that of the pulsations:—At the commencement of the first year, the pulse ranges from 120 to 130 beats, towards the second year it comes down to 100, at three years of age it falls to between 90 and 100, at seven to about 90, and at the adult age it ranges in general from 75 to 80; according as the individual advances in years, it varies from 70 to 80, and amounts to no more than from 60 to 65 in confirmed old age. Such are the data with respect to the influence of age on the pulse which have received the sanction of time and authority. Mr. Billard, however, in his work, entitled *Traite des Maladies des Enfants nouveau-nés*, states that the pulse of new-born infants is often as slow as that of adults. It should be held in recollection that the number of beats of the artery in a given time is greater for some time immediately after digestion. The frequency of the pulse varies very much in different individuals, being very slow in some, and very rapid in others, though in a state of perfect health. Thin and delicate persons have in general a frequent pulse.

As the movements of the artery are the result of the contraction of the

time of day, and the bodily and mental influences to which the patient is exposed at the time of examination.

The morbid phenomena in the pulse arise from abnormal qualities in the action of the heart, contractility of the arteries, and the state of the blood. The action of the heart is modified partly by its idiopathic diseases, partly by the lungs and brain, and partly by the peripheric vascular system. The contractility of the arteries is a fine measure of the inflammatory or spasmodic tension predominant in the body; its changes run parallel with those of the mucous membranes. The state of the blood is the third momentum which exercises great influence on the quality of the pulse. To this series of causes belong not only the variation in the quantity and quality of the blood, but also the dynamic disturbances of the blood, which have been as yet but little investigated. The pulse varies in frequency, rhythm, equality, duration, and intensity of the stroke against the finger, and in the feeling of size, fulness, and of tension which the artery excites.

289. The frequent pulse (p. frequens) occurs under two states:—

(1.) In plethora, irritations, inflammations, more especially those of the general integuments of the mucous, synovial, and serous membranes, and of the parenchymatous structures in the neuroses; inflammations of the brain, heart, and pericardium, accelerate the pulse much less than those of the parts above mentioned. The pulse is then at the same time strong, hard, and full. A frequent pulse precedes active hæmorrhages* and

left side of the heart, it is but natural to suppose that the pulse expresses the order, regularity, and even the strength, of the heart's contraction. Such, however, is not always the case; the functional state of the heart is not always represented by the quality of the pulse. M. Rostan has observed that in certain cases hypertrophy of the left ventricle co-existed with a very small pulse. M. Bouillaud has remarked that in concentric hypertrophy of the ventricles the pulse is very weak.—*loc. cit. Trans.*

* The increased frequency of the pulse occasioned by profuse hæmorrhages has been thus accounted for by M. Piorry:—"Since the quantity of blood is diminished, the heart contains less of it, and its contraction must be performed more rapidly than if it contained a greater quantity."

Another cause of increase in the frequency of the pulse mentioned by M. Piorry is—"An obstacle to the circulation of the blood near the heart, or in some part of the circulatory apparatus, such as to render the course of the blood difficult," the heart being then obliged to compensate for the small quantity of blood which circulates, by the frequency of its pulsations.

—*Trans.*

crises ; in organic diseases, it denotes complication with an irritation or inflammation, and may, according to the nature of the case, announce absorption or further extension of the disease. One hundred and fifty beats in a minute in adults give an unfavourable prognosis.

(2.) The pulse is frequent in states of great debility, particularly those states where the vascular system itself suffers, as in considerable eccentric atrophy of the heart, after great losses of blood, &c. The pulse is then at the same time small and weak, (in the extreme degree, *pulsus tremens*.) This kind of frequency yields an unfavourable prognosis ; it precedes death in many diseases.

290. The rare pulse (*p. rarus*) presents its higher degree in cerebral diseases, especially those which are combined with cerebral pressure, as in hydrocephalus, apoplexy, hyperæmia, and softening of the brain, tumours pressing on the brain, and also in syncope ; and moreover, in heart diseases, those principally which cause an obstruction to the circulation, through a change in the left arterial opening of the heart, and along the course of the thoracic aorta ; in the blue disease ; lastly, hepatic diseases exercise an influence on the heart which makes its contractions more rare.

In a minor degree, the rare pulse is observed in most chronic diseases.

291. Loss of pulse may be produced locally, by abnormal distribution, or smallness of the arteries of the part so affected, by their inflammation, by the pressure of tumours on them, by aneurisms, &c. General loss of pulse occurs in syncope, apparent death, and oriental cholera. In the latter, it is of very bad import.

292. The regularity of the pulse is in general a favourable sign in diseases ; however, many persons have an irregular pulse without being ill, and in such persons it sometimes becomes regular in disease.

The irregular pulse is divided into two principal species, according as the number of the strokes is increased or diminished by the irregularity.

To the latter head belong the intermitting pulse, and that which is called irregular in the stricter sense ; to the former belong the interciduous, intercurrent, and dicrotous pulse. In the first, obstructions to the circulation in the heart and lungs, and from cerebral disturbance, are the cause ; the latter depends on the exertions of the heart to contribute to a crisis, or, in case of extreme debility, to carry on the circulation.

293. The intermitting pulse (*p. intermittens*) will therefore occur in narrowing of the valves, more especially on the left side of the heart, in endocarditis, polypi of the heart, in eccentric hypertrophy, hydro-pericardium, aneurism of the aorta, in all diseases of the air-tubes, lungs, or pleuræ, where a part of the lungs has become impervious, or the entrance of the air has been prevented. Diseases of the brain occasion very frequent intermission of the pulse, particularly inflammation of the brain, effusions into this organ, softening of the brain, apoplexy, or spasmodic attacks. When gastric affections, especially peritonitis, gastric irritation, or worms, have this influence, it is to be explained by reference to the nervous system. In case of great debility, the intermitting pulse is very bad. It sometimes precedes gastric crises. If the pulse in the course of any disease becomes intermitting, and other signs of heart or cerebral disease become combined with it, the prognosis is suspicious.

294. The irregular pulse is the higher degree of the intermitting. The strokes not only continue an indefinite time, but they also are mostly unequal. It is a sign of the higher grades of those heart diseases which occasion intermission of the pulse, besides, and more especially, of considerable eccentric atrophy, and of a fissure of the heart. In the same way, also, the same disturbances of the respiration and of cerebral life produce the irregular pulse. Congestions of the brain, and irritations of the alimentary canal, as also disturbances of the urinary and intestinal excretions, have the same effect.

295. With respect to the pulse which is irregular through increase in the number of the strokes, the obstruction to the circulation which causes it appears to lie more in the capillary vascular system than in the central parts of the vascular system.

In the interciduous pulse, (*p. interciduus*,) after a series of regular strokes, an interciduous stroke occurs. It presents itself as well in case of inflammatory tension, more especially where this has risen to an extreme height before the critical secretions, in acute exanthems and rheumatisms, as also in extreme debility occurring in severe diseases of important organs. In the intercurrent pulse, between the regular greater strokes, there occur from time to time smaller strokes following each other at shorter intervals. This kind of pulse has been observed in inflammations, catarrhs, rheumatisms, in gastric fevers, where it usually preceded the crisis.

The dicrotous pulse (*pulsus dicrotus*), in the midst of a

regular series of strokes, presents two which follow each other rapidly.* It announces the approach of critical phenomena, more especially epistaxis and sweating.

296. If in disease the strokes of the pulse continue equal to each other in size and strength, this may be always looked on as a favourable sign. The unequal pulse is a sign of obstructions to the circulation, whether these be in the heart itself and lungs, or in the periphery of the vascular system. Among the diseases of the heart, we may particularly specify in this place inflammation of the organ, effusion into the pericardium, organic changes in the parietes of the heart and its valves. Diseases of the brain and its membranes produce inequality of the pulse by its influence on the heart. To this head belong all the diseases of the respiratory organs which prevent the entrance of air into the lungs, or at least a considerable portion of it. In the inflammatory tension before crisis, and in extreme debility, inequality of the pulse likewise occurs. Varieties of the unequal pulse are, the vermicular pulse (p. *vermicularis*), where the strokes constantly become weaker; the vacillating pulse, (p. *vacillans*), which passes rapidly from a great stroke to a small one; and the mutilated pulse (p. *myurus*), where the pulse-strokes decrease in strength, and suddenly cease. These three varieties are of bad import; they precede syncope and the last struggle in excessive losses of blood, and in the last stage of consumption. If the pulse at both radial arteries be not equal, or not isochronous, this mostly depends on disease of the one artery, or on pressure made on it; it is also observed to occur in nervous fevers. If this precedes cessation of the pulse, there is reason to apprehend an unfavourable termination.

297. According to the duration of the stroke on the finger, we have the rapid and the sluggish pulse. The rapid pulse is observed in irritations, inflammations, and during spasmodic attacks. It is commonly at the same time frequent. If with the character of rapidity it also has that of hardness, it is called the serrated pulse, (p. *serratus*.) A rapid pulse without great frequency particularly occurs in excitement of the heart, and in pericarditis. It is rapid, frequent, and small, in case of great debility of the patient, in nervous and hectic fevers, or in the transition of an inflammation into gangrene; it then indicates the greatest danger. In spasms, it is not attended with this

* *Pulsus dicrotus*. This kind of pulse was noticed by Galen as announcing epistaxis.—*Trans*.

unfavourable import. If the rapid pulse be at the same time hard and strong, violent inflammation is present; however, it frequently assumes this form before the crisis.

The sluggish pulse indicates diseases of the heart, more especially hypertrophy and vascular changes, as well as apoplexy, softening and other diseases of the brain, which are combined with sopor. Besides, it also appears to depend on the state of the blood; in putrid fever, and in scurvy, this pulse is very frequently met.

298. According to the intensity of the stroke, we have the strong and the weak pulse. The strong pulse (*p. fortis*) is observed in inflammations, and in all states where individual organs are overloaded with blood, as in congestions of the head, and in delirium tremens. Hence it precedes hæmorrhages from the mucous membranes, apoplexy, the occurrence of inflammation and hyperæmia. In apoplexy, it is a bad sign, and gives reason to apprehend repeated attacks.

The weak pulse (*p. debilis*) partly characterizes morbid states of the blood, more especially anæmia after losses of blood, severe evacuations, and partly proceeds from extreme debility of the nervous system, as occurs in nervous fevers, and in many cases of hysteria and hypochondriasis, or takes place during the transition of the plastic into the destructive processes, (gangrene, softening, purulent infiltration.) If there be grounds for suspecting this latter case, the prognosis is bad. In the extreme grades, it appears to creep away under the finger; if it be at the same time very rapid and unequal (*p. formicans*), the prognosis is very bad.

299. Fulness of the pulse, as contrasted with the kinds of pulse hitherto noticed, seems to depend chiefly on the quantity of blood. The full pulse, (*p. plenus*), where the artery feels swollen and proportionably strong, is produced as well by plethora as by a vitiation of the blood in scurvy and putrid fever. In acute diseases, it is a precursor of hæmorrhages, evacuations, sweating, exanthematous eruptions, which, if it be at the same time strong, may be considered as critical; it is then called undulating, (*p. undulans*.) But if it be full and weak, vitiation of the blood is present, and passive hæmorrhages are to be dreaded.

The empty pulse (*p. vacuus*) gives the feeling of a small volume of artery. In cases where it is observed, the quantity of blood may be diminished in consequence of the loss of blood, or of deficient nutrition; it then affords an unfavourable pro-

gnosis. It may also, moreover, indicate disturbances of the circulation with accumulation of blood in individual organs, as in the brain, in case of pneumonia in the lungs, in congestions of the portal system in the abdomen.

If the pulse be at the same time frequent and rapid, as in pneumonia, great danger exists. It is, on the contrary, rare and empty in hysterical paroxysms.

300. Allied to these is the great and small pulse ; in these varieties, the breadth as well as the length of the wave of blood must be considered. The great pulse (*p. magnus*) indicates a powerful action of the heart, the resistance of the periphery at the same time yielding. It precedes critical evacuations and hæmorrhages. Hence it is in general favourable in states of inflammation and congestion, unless the congestions are towards the head, and accompany apoplexy. In like manner, it is not favourable where it originates from hypertrophy of the left ventricle. The small pulse (*p. parvus*) is occasioned either by narrowing of the aortic opening, by atrophy, considerable eccentric hypertrophy of the heart, or the mass of fluid is diminished, the strength is sunk, as after profuse evacuations, suppurations, hæmorrhages, at the end of chronic diseases, in the transition to gangrene and suppuration. If it is then at the same time weak and soft, the prognosis is bad. In spasms, and at the commencement of inflammations, it is small and hard, without rendering the prognosis worse.

301. The tension of the pulse depends chiefly on the tone of the arterial parietes. The hard pulse (*p. durus*) gives a certain measure for the inflammatory and spasmodic tension which is produced by inflammations, more especially of the serous membranes, the lungs, the heart, and arteries, and by hysterical and hypochondriacal paroxysms.

So long as the pulse retains its hardness, inflammation or spasm is present. The longer it holds, the sooner is suppuration or induration to be dreaded. The hard pulse in spasms is distinguished by its smallness and irregularity from the inflammatory hard pulse, which, except in abdominal inflammation, is at the same time strong and regular. If a hard pulse appear in chronic diseases not inflammatory, an inflammatory complication may be suspected. It precedes active hæmorrhages. However, it must not be forgotten that cartilaginous formations and ossifications of the arteries also produce hardness of the pulse.

As varieties of the hard pulse may be considered the rigid

pulse (*p. rigidus*), the hardish pulse (*p. duriusculus*), the skipping pulse (*p. caprizans*), and the hammering pulse. The rigid pulse is caused by ossification of the arteries, or hypertrophy of the heart. The hardish pulse marks the transition into inflammation and that into suppuration and absorption. The skipping pulse is a combination of the hard, rapid, and unequal pulse. A hard, rapid stroke is followed by a weaker one. To its formation, increased contractility of the arteries, as well as inequality in the heart's contractions, seem to contribute. These conditions are found united in hysterical spasms, in critical disturbance, and the last struggle in those who die when inflammation is at its height, or in consequence of apoplexy.

The hammering pulse is a combination of the hard with the frequent and rapid pulse. It is observed in arteritis and in rheumatism, especially when it attacks the circulatory apparatus.

302. The soft pulse indicates diminished contractility of the arteries. It shews itself under two orders of circumstances: (1) combined with extreme debility in the nervous stage of typhus, in plague, towards the end of chronic diseases, in the transition from inflammation to suppuration and gangrene; it is ordinarily at the same time weak, unequal, and irregular; the prognosis in these cases is bad; (2) in irritations and inflammations, when the critical secretions occur; hence a soft pulse accompanies catarrh of the digestive and respiratory organs, when the secretions have commenced. In inflammations, if it be at the same time strong and irregular, it is of favourable import, by confirming the critical value of the secretions accompanying it.

303. Constancy of the pulse, whatever qualities it may have, is more favourable than a frequent change in the same; the inconstant pulse, unless it precede a crisis, is a sign of great violence of the disease. Qualities of the pulse which under other circumstances yield a bad prognosis, are favourable when they are combined with the precursors of crisis; if they occur in spasms, they have at least no unfavourable import.

The doctrine of the organic pulses has not been confirmed by experience to the extent that has been stated. The pulse has in general more value for discovering the character of disease in general, and for prognosis, than for discovering the seat of disease.

With respect to the utility and applicability of Herissot's sphygmometer further experience is still required.

III. SIGNS FROM THE VEINS.

304. In judging of the signs from the veins, it is necessary to consider the varieties of venous life according to the age, sex, temperament, and mode of life. Besides the venous pulsation already mentioned, and which also takes place in aneurismatic varix, and in the case where a vein lies on an artery, the veins afford also four signs—namely, fulness and emptiness, dilatation and narrowing, which, for the assistance they afford in prognosis, deserve to be more attended to than they have hitherto been.

305. Fulness of the veins, their distention with blood, where this appears over the entire body, is a proof that the circulation is disturbed in its central organ or in the lungs, or that there is too great a quantity of blood in the body. If the distention of the veins is confined to one part of the body, this depends either on congestions towards this part, or the return of the blood is prevented from want of propulsive power, when the artery is disturbed in its function, or in consequence of mechanical obstructions in the veins and in the right side of the heart. Distention of the veins of the neck and face gives a suspicious prognosis. It frequently precedes and accompanies apoplexy. It is also to be considered as a sign of suffocation.

If the veins of the two lower extremities present this phenomenon, the cause generally consists in disturbance of the portal system, especially diseases of the liver, or tumours which are developed in the abdomen and compress the venous trunks. Besides, an organic change on the right side of the heart may also give rise to this phenomenon. When, however, the distention of the veins is confined to one extremity, disease of the veins or arteries of the limb in question, or pressure on these vessels, is frequently the cause.

306. Emptiness of the veins occurs under two circumstances, (1) in the cold stage of fever, especially that of intermittent fever, through congestion of the mass of blood towards the internal parts; (2) after profuse hæmorrhages. In this case it is a very unfavourable sign.

Normal fulness of the veins is a favourable sign in acute and chronic diseases; it is a proof that neither excessive congestions nor any considerable obstruction to the circulation exists in the heart or portal system.

307. Dilatation of the venous parietes (phlebectasia) arises in three ways:—

(1.) In a mechanical way, by obstructions of the venous circu-

lation; these may have their seat in the heart and large arteries, or in the veins. In the first case, it will form in various parts of the body, and yield a bad prognosis; in the latter, only in certain departments of the venous system, and then venous dilatation has no unfavourable import, unless the seat of the phenomenon is in the neck or on both the lower extremities, as for instance after closing of the inferior vena cava.

(2.) Venous dilatations occur in consequence of temporarily excited action of the capillary system, especially if secretion or nutrition does not proceed *pari passu* with the current of blood. This exaltation of action may be founded on physiological causes, as on the development of the testicles, menstruation and pregnancy, or it may be of pathological origin, as long continued irritation of the intestinal canal or bladder, conjunctivitis, or cancer of the breast. If venous dilatations have arisen in this way, the prognosis is better than in the first case. If the cause has ceased, the dilated veins still remain; if, however, it continue to act, the degenerescence of some organ may in this way be induced.

Lastly, relaxation and softening of the venous parietes in lingering diseases attended with great debility seem to favour the formation of venous dilatations.

Varix is the disproportioned extension of a small part of a vein. Varices on the larger veins, as on the jugular, saphena, &c., as also those giving rise to ulceration, yield a doubtful prognosis.

308. Narrowing of the veins is occasioned by coagulation of the blood, thickening of the venous membranes, and by compressing tumours. As a sign of phlebitis, it is always of suspicious prognosis. On account of the serous infiltrations which such a narrowing of a vein occasions, it may be looked on, if phlebitis be not the cause, as an unfavourable sign.

IV. SIGNS FROM THE BLOOD.

309. These are deduced from the manner in which the blood flows; from its colour, taste, and smell; from its temperature, consistence, coagulation; from the proportional quantities of the serum and blood-globules; from the external properties of both, and from certain admixtures. A deficient or weak efflux of blood is a sign of a deficiency of blood, of too thick a blood, and of a want of propelling power, the cause of which may lie in diseases of the heart and lungs, or is occasioned by morbid

states of the brain and spinal cord. It takes place after severe hæmorrhages, in oriental cholera, in severe pneumonia, in syncope, apoplexy, and inflammation of the brain. The import of this symptom, except in syncope, is very unfavourable. If the stream of blood become gradually stronger, and the pulse at the same time rises, a favourable prognosis may be formed, for this warrants us in inferring the existence of inflammation; it justifies the abstraction of blood, and precedes the critical phenomena.

A strong efflux of the blood, if it hold up a long time, is a sign of irritation and inflammation combined with plethora. In deciding on this point, we must take into account the width of the venous opening, the favouring circumstances, and the obstructions of the efflux. If the blood escape in jerks, an artery has been opened, or a vein lying on an artery. A uniform stream characterizes venous blood, whilst trickling indicates blood coming from the capillary vessels.

310. Bright red blood belongs to the arteries, dark red to the veins. The excessively dark red colour of the venous blood arises from two principal causes; (1) from the vitiation of the blood in scurvy, purpura, typhus, plague, and yellow fever; in the latter febrile states it is a bad sign: (2) from deficient decarbonization, whether the respiration be disturbed, or all the venous blood does not pass through the lungs, or the portal system and liver be involved in morbid processes. Hence the venous blood will be found of a dark red colour in all diseases of the lungs which suddenly interfere with the respiration, in all diseases with asthmatic paroxysms, in pneumonia, in cyanosis, in disturbances of the menstrual flux and hæmorrhoids, in hypochondriasis and melancholy.

The venous blood becomes a bright red in morbid processes where the circulation is accelerated and the actions connected with the capillary system are involved; hence it occurs at the onset of violent fever, particularly of the acute exanthems, cerebral and pulmonary inflammations, at the commencement of typhus, of putrid fever, and in tuberculous disease. It is partly combined with great debility, and then dangerous, and partly with violent fever.

Pale blood is a sign of chlorosis, or poverty of blood. It is yellowish in diseases of the spleen and liver (jaundice), after the bite of a viper, and also in putrid fevers.

White blood appears to owe its colour partly to a surplus of fibrine and albumen, partly to the admixture of fatty substances.

It has been observed in diseases of the spleen and liver, for instance, after intermittent fevers, and in acute diseases, where during meagre diet the fat of the body has been reabsorbed. Fatty eyes appear in consumptions.

311. The blood in diabetes should taste sweetish, in syphilis rather saltish, according to Lauer; in liver diseases, it should have a bitter taste. The blood assumes the smell of several substances, especially of alcohol, musk, &c.; in diseases combined with depravation of the blood, as in scurvy, plague, putrid fever, it has a stinking smell.

The temperature of the blood keeps pace with that observable on the skin. In violent inflammations, it is raised to 104° F., and remains a long time in the blood when drawn; in dropsy, spasms, and cyanosis, it is reduced to 95° F.

312. Diminished consistence of the blood arises through a deficiency and a morbid change in the fibrine. Hence it is observed after profuse loss of blood, in chronic diseases, more especially colliquative phenomena, and in morbid states combined with depravation of the blood, as purpura, scurvy, and all fevers which take on the putrescent character.

An increase of consistence follows partly from an increase of the cruor and fibrine, partly from a diminution of the serum. We have recourse to the first source when it occurs in states where normal or habitual secretions from the blood are suppressed, where the consistent secretions and nutrition are rapidly checked, and absorption becomes increased, as in inflammatory diseases. Hence there is found a thick blood in plethora, in the apoplectic habit, in disturbance of the menstruation, or of hæmorrhoids, in hypochondriasis, melancholy, &c.

To the second cause it will have to be ascribed in profuse sweating, in diabetes, and partly also in oriental cholera.

The increased consistence sometimes occasions the formation of a scum on the surface of the blood when drawn. This is viewed as a sign of inflammation.

313. Absence of the coagulability of the blood takes place in plague, typhus, and putrid fever; it is here a very dangerous sign. Coagulability is also wanting in sudden death by suffocation, especially in coal-damp, also in sudden abolition of nervous power by lightning, electricity, or prussic acid. Slow coagulation of the blood, that is, later than seven minutes after being drawn, is observed to take place in congestive and inflammatory states. Rapid coagulation of the blood is the consequence of diminished nervous influence in putrid fevers, gangrene,

and inflammation of the brain. It is on this account a very dangerous phenomenon.

314. Whilst the process of coagulation is proceeding, the blood in the normal state separates, from three to five hours after it is drawn, into crassamentum and serum. This separation does not take place in many cases, as in scurvy, and putrid fever; or only imperfectly, as in purpura, in nervous and gastric fevers, particularly in the later periods of typhus, and in cachectic states. In these cases, it sometimes presents itself as a black sediment. The firmer the crassamentum is, the more perfect is the coagulation; this occurs chiefly in the inflammatory diathesis, and in inflammation.

The relation as to quantity between serum and crassamentum varies considerably in diseases. In chlorosis, dropsy, and after severe losses of blood, the serum is present in an anomalous quantity, whilst in plethora and inflammation, on the contrary, the crassamentum predominates. When the coagulation is imperfect, the serum is turbid, and then mostly dark red; besides, in many states, separate flocculi swim about in it, as in diabetes mellitus, and in many inflammations. The serum is a bright red in plethora and inflammation, yellowish in liver diseases, especially those combined with jaundice; greenish likewise in jaundice, as also in chlorosis and yellow fever.

Slight consistence of the crassamentum arises from imperfect coagulation, when the life of the blood is injured in consequence of disturbed respiration or diminished nervous influence. Hence it is always an unfavourable phenomenon. A tough crassamentum is a sign of increased vitality of the blood; it presents itself in inflammations and irritations. If it attain a high degree, an inflammatory membrane forms.

315. The inflammatory or buffy coat is a yellowish or greyish, and sometimes reddish, membrane, usually with turned up edges, which consists of a predominant quantity of fibrine, some albumen, and, according to Orfila, of gelatine with water. It is firmly united to the other part of the crassamentum, distinguished from it, however, by a well-marked line. This contains less fibrine than in the normal state, and hence is much softer. The serum contains less albumen, and hence is specifically lighter. The whole blood taken together contains more fibrine, in proportion to the cruor, water, and albumen. These circumstances, the increase of the fibrine, the greater specific lightness of the serum, and the proportional diminution of the albumen, seem to cause the cruor to sink, and the fibrine to float on

the surface. The condition producing this change in the constitution of the blood is given in all states where the plastic process is exalted. Among the physiological conditions, we may mention pregnancy; under the pathological, inflammations and the states disposing thereto; we find this particularly marked in inflammations of serous membranes, and of parenchymatous structures; with respect to irritations, those evince it which attack an organ capable of no plastic secretion, as fibrous structure contrasted with mucous membranes. Hence the buffy coat is observed in rheumatism.

The inflammatory coat is of great value in distinguishing inflammation from other diseases, which, according to experience, present no buffy coat. If it increase after various venæsections, this indicates increasing violence and extension of the disease. Strong contraction of the buffy coat into the form of a cup, as every perfect coagulation, is a sign of undisturbed nervous influence and moderate disease. A broad buffy coat, raised in the middle, which is generally at the same time very thick, shews that the morbid process has attained an intensity too much for the strength, and that the disease is changing into the nervous form.

316. With respect to heterogeneous materials, small particles, chiefly consisting of phosphate of lime, have been found in the blood, principally in gout and rickets. Purulent, cancerous, and tuberculous masses have been occasionally found in veins leading from parts affected with these diseases.

V.

SIGNS FROM THE RESPIRATORY ORGANS.

Signs from the Respiration.

317. IN judging of the signs derived from the function of respiration, it is necessary to take into account the physiological varieties resulting from age, sex, temperament, the sleeping and waking state, mental emotions, bodily exertions, the temperature and pressure of the air, and lastly, the position of the body. There are two modes of examining the respiration,—(1) by ob-

erving the motions of the thorax, and the entrance and exit of the air through the nose and mouth ; (2) by auscultation of the sounds produced by respiration in the lungs. Besides the diseases of the respiratory organs themselves, the state of the vascular system, abdomen, and brain, have the greatest influence on the motions of the thorax. In the second mode, on the contrary, with the exception of the frequency of the respiratory sound, we shall obtain merely and exclusively those changes of the respiration occasioned by disease of the respiratory organs. Hence, for diseases of the lungs, auscultation will be of greater semeiological value than the first mode of examining the respiration.

318. If the respiration be examined in the first way, according to its external phenomena, attention must be paid to the following points : (1) the frequency of the breathings and the motions of the chest ; (2) their quickness ; (3) the degree of the expansion of the chest ; (4) the relation of the individual respirations to each other ; (5) the difference of the inspiration and expiration ; (6) the degree of exertion of the parts subservient to breathing ; (7) the sensation of the patient in respiration ; (8) the sound accompanying respiration.

319. The frequency of the respiration is increased when a part of the lungs is no longer able to perform its function, or when too great a quantity of blood is presented to the lungs for decarbonization. The first takes place in inflammation or suppuration of the lungs, in the formation of tubercles, medullary sarcoma, melanosis, also in compression of the lungs, and from effusion, medullary sarcoma of the pleura, incurvation of the vertebral column, and lastly in contraction of the organs which conduct the air. In the second cause of frequent respiration, two cases are possible,—either the blood passes more rapidly, and hence in a given time in greater quantity, through the lungs, as in all febrile states, or the lung is overfilled with blood in consequence of disease of the heart. The prognostic value varies according to these causes. If the frequency of the respiration diminishes and increases with the fever, the prognosis is more favourable than when it bears no proportion to it. The frequency may amount up to 60 breathings in the minute.

The rare respiration (*resp. rara*) arises from debility of the muscles of respiration, especially when at the same time the action of the heart is diminished or suspended, as in syncope ; besides, it may become rare in apoplexy, sopor, coma vigil, or catalepsy, and in the extreme debility which in many diseases

precedes death. In this latter case, as well as in apoplexy, it is of the worst import.

320. The respiration is called quick when the movements of the thorax are performed with great rapidity. If the quick respiration is at the same time frequent, it divides the semeiological import of the latter. If it be quick and rare, the patient is forced to it either by the pain which breathing causes to him, as in pleuritis, or by the weakness of the muscles of respiration, which takes place after long and violent exertions of the same in pneumonia, tubercles, chronic bronchial catarrhs, effusion into the cavity of the pleura. It then has a very unfavourable import.

A slow respiration (*resp. tarda*) takes place partly in states where the action of the heart is diminished, as in syncope and apparent death, and partly in case of general and considerable debility with small weak pulse and cold extremities, where it affords a bad prognosis.

321. According to the degree of expansion of the chest, the respiration is distinguished into the great and small, (*resp. magna, r. parva.*) In the great respiration, the chest expands considerably and uniformly. If this occur with states of the respiration in other respects normal, it may be looked on as favourable, as a consequence of necessity, because much blood is to be decarbonized. But if the breathing is at the same time rare and slow, some affection of the brain is the cause, especially in nervous fevers, apoplexy, and inflammation of the brain and its membranes. It precedes sopor, convulsions, and delirium. An apparently great respiration, where indeed the thorax expands very much, but still little air is inspired, is a sign of obstruction in the organs which admit air, as in bronchial catarrh, or of inutility of some portion of the chest, as in pneumonia, emphysema, hydrothorax, pleuritic effusions, &c. The small respiration is caused by the small expansion of the chest, and the small quantity of air inspired and expired. The cause may lie in the lungs, if a part has become impervious to air; but moreover it indicates obstructions, which lie in the respiratory muscles, spasm or debility of them, or some prevention of the free action of the diaphragm through enlargement of the liver and spleen, or through rupture of the diaphragm. The small respiration caused by debility is the worst. That produced by spasm has nothing alarming in it.

322. A normal rhythm of the respirations, where the intervals continue equal in length, is a favourable phenomenon

in diseases. An irregular respiration is connected with the extreme state of debility through cerebral affections and spasms. If this amount to the cessation of a breath, the respiration is said to be intermitting. It is an unfavourable sign in cerebral diseases, and in severe cases of pneumonia. If the individual respirations be equal to each other in greatness and quickness, this is more favourable than inequality of the same, when for instance a small follows a great respiration, &c. If the inequality does not depend on sighing, it mostly indicates severe cerebral affections, dangerous pulmonary diseases, and the debility which occurs before death. It does not present this unfavourable import where it occurs in the cold stage of fever, or in spasms. According to the uniformity in the motion of the individual parts of the chest, a distinction is made into general uniform motion and into partial. The latter is a sign of a considerable pleuritic effusion, of hydrothorax, and of tubercles complicated with pulmonary inflammation, and should always be considered as very unfavourable. It occurs also in deformities of the chest.

323. In the normal state, the inspiration lasts longer than the expiration. The relation is inverted if the inspiration causes great pain, as in pleuritis, or peritonitis; the inspiration is then cut short, and ceases suddenly (*r. intercisa*), or when the lungs cannot retain the air in consequence of a part of them being impervious, as in inflammation and in tubercles of the lungs.

324. In exertion of the parts subservient to respiration, there are three points to be distinguished—(1) the degree of exertion; (2) the parts more particularly exerted; (3) what act of the respiratory function more particularly desires greater or less exertion. In reference to the degree of exertion, respiration is divided into the easy, weak, strong, and difficult. The easy respiration is a very favourable sign, more especially in fevers; by its presence it removes the unfavourable import of many other signs, especially those of the pulse.

In the weak respiration (*resp. debilis*), the exertion of the respiratory muscles is less than in the normal state. In syncope and catalepsy it does not render the prognosis unfavourable unless it becomes entirely imperceptible in the former, where the state passes into apparent death. But if it occur in pulmonary diseases, (tubercles, apoplexy, &c.) or in nervous fevers, it is a precursor of death.

The strong respiration (*resp. fortis*) evinces considerable exertion of the respiratory muscles. It indicates disease of the organs which conduct the air, more especially of the larynx, and narrowing of the bronchial branches, or increased pressure of blood to the lungs in fevers and heart diseases. It accompanies asthmatic paroxysms. In diseases of the larynx, it bears an unfavourable import. Difficult breathing (*dyspnœa, resp. difficilis*) is the higher grade of the strong. It occurs in case of a portion of the lung being impervious, as in pneumonia, tubercles, apoplexy of the lungs, effusions into the cavity of the pleuræ, medullary sarcoma of the lungs or pleuræ, and in deformities of the chest which act injuriously on the lungs, in hyperæmia of the lungs from bronchial catarrhs, and when the diaphragm is impeded in its motions by tumours in the abdomen. The greater the exertion, the worse is the prognosis.

325. According as the exertion is more perceptible in this or that part, it is divided into abdominal, pectoral, cervical, and cephalic. In abdominal respiration (*r. abdominalis*), the diaphragm chiefly exerts itself, the abdomen rises and falls considerably. If the chest be at the same time moved considerably, it is a sign of great obstruction to the respiration, especially of inflammation of the lungs, pleura, heart, and of asthma. If the movement be confined to the abdomen, either apoplexy is the cause, or extreme debility in fevers, or fracture of the ribs, or pleuritis, render the thoracic respiration painful. Ruptures of the diaphragm also may occasion the abdominal respiration.

The thoracic respiration, when the abdomen does not move, indicates obstructions to the free action of the diaphragm, enlargement of the liver and spleen, meteorism, tympanitis, repletion of the stomach, and ascites; in peritonitis, the patient breathes chiefly with the chest, in order to avoid pain.

The more the upper ribs co-operate in moving, the more important is the hindrance of the respiration. This, called the *respiratio sublimis*, or high respiration, is chiefly observed in hydrothorax, chronic bronchial catarrh, tubercles, pneumonia, pleuritis, and also in dilatations of the heart, and in pericarditis.

The cervical respiration (*resp. collaris*), where the inspiration is effected with considerable exertion of the muscles of the head and neck, indicates a higher grade of difficult respiration in diseases of the lungs and heart, and chiefly in those of the larynx. The highest degree of this is constituted by the cephalic

respiration (*r. cephalica*), where both nose and mouth move with great violence in expiration and inspiration. It bears an unfavourable prognosis.

326. Inspiration is the difficult part of the respiratory act chiefly in diseases of the larynx, in œdema of the glottis, inflammation of the epiglottis, in chronic laryngitis, in Millar's asthma, and in most cases of croup. At the end of the inspiration the difficulty occurs in diseases of the pulmonary parenchyma and of the pleura, in pneumonia, pleuritis, pulmonary œdema, and hydrothorax. In diseases of the bronchiæ, the expiration is the part principally difficult. Finally, there are cases of difficult respiration, where the patient, whilst he breathes with frequency and difficulty, still can take a deep inspiration. In such cases, the respiratory organs are not the seat of the disease, but generally the heart, or brain, or the disease is of a spasmodic nature.

327. A permanent dyspnœa in diseases of the lungs, heart, and great vessels, is of an unfavourable prognosis. It is more favourable when intermitting. In the acute affections of the thoracic organs, the degree of the dyspnœa is not always directly proportioned to the organic change; a very laboured respiration is bad in acute cases.

In chronic diseases of the respiratory organs, a gradually increasing dyspnœa, without remission, is of unfavourable import. Dyspnœa setting in with the repulsion of the acute exanthems is an unfavourable sign. If it arise through spasms, it bears no unfavourable import. If it be the consequence of profound debility, death is nigh at hand.

328. The disturbances of sensation which affect the breathing are, pain and anxiety. Pain presents itself in catarrhal and inflammatory diseases of the respiratory organs and peritoneum, more especially in inspiration; according to the place where it occurs, it denotes inflammation, or ulceration of the larynx or trachea, catarrh, pneumonia, pleuritis, pleurodynia, peritonitis, &c. If pain is experienced, in the case of respiration in other respects easy, only on taking a deep breath, there are adhesions of the lungs to the costal pleura, or an inflammatory process is going on in the abdomen. The anxious respiration is a sign of considerable disturbance of the circulation, whereby both lungs and brain become overloaded with blood. Hence it denotes inflammation and dropsy of the pericardium, organic changes of the heart, particularly of its openings, as well as all those states where the entrance of the air into the lungs is pre-

vented, as in diseases of the larynx, foreign bodies in the air-passages, pressure on the trachea or bronchi, as well as when a considerable portion of the lungs has become impervious, as in extended pneumonia, hydrothorax, pneumothorax, &c.

329. Normal respiration takes place without any sound being audible to the ear removed from the chest. The respiration is sibilous in laryngitis, in œdema of the glottis, in croup, in asthmatic paroxysms, in hysterical cramps of the neck, in extensive adhesions of the lungs to the costal pleura.

The sighing respiration (*r. suspiriosa*) arises partly from a congested state of the lungs, partly from debility of the respiratory muscles. Syncope and hysterical paroxysms frequently terminate in this way. It is frequently found combined with diseases of the liver, chronic affections of the intestinal canal, and hypochondriasis. In diseases of the brain, and acute hydrocephalus, it is an unfavourable sign.

The panting respiration (*r. anhelosa*) is a sign of extraordinary exertions in respiration, which become necessary by morbid degenerescence of the lungs, compression of these organs, or obstruction to the entrance of the air, when the hindrance lies beneath the larynx.

The stertorous respiration (*r. stertorosa*) occurs in the larynx and trachea, in consequence of inability to expectorate the collected masses of mucus. It precedes death in apoplexy, and extravasation into the brain. In pneumonia, pulmonary tubercles, at the end of chronic bronchial catarrh, it is in like manner of the very worst import. Closely allied to this is the gurgling respiration, in which the patient has still the power to expectorate: it indicates the collection of sputa in the air passages; hence it occurs in bronchial catarrh, hæmoptysis, pneumonia, hydrothorax, and pleuritis; and so long as it does not assume the character of rattles, it brings no unfavourable prognosis. In pneumonia, it precedes disorganization.

Snoring is produced in the mouth, throat, and nasal cavities; stoppage of the nasal cavities, catarrh, and polypi of the nose, are frequently the causes. It occurs principally in profound sleep, and sometimes accompanies pressure on the brain, apoplexy, and delirium. It then has an unfavourable import.

330. When one would obtain correct results from auscultation of the respiration, it is indispensably necessary to compare the respiration of the different parts of the lungs with each other; in doing so, it becomes necessary to take into account

the physiological varieties according to the part examined, as also according to the age, sex, and temperament of the patient. Auscultation may be practised with the naked ear or with the stethoscope; the latter has the advantage in certain parts of the chest, and under certain circumstances.

The respiratory sound varies in diseases according to its intensity, according to the relation of the expiration to the inspiration, also according to its tone and clearness.

331. The intensity of the respiratory sound is increased before puberty over the entire extent of the lungs (*resp. puerilis*); it continues in this state in many individuals of the female sex, and in weakly men, even to an adult age; it is sometimes connected with asthma. Where it is confined to a part of the lungs, or to one lung, it denotes, partly, hypertrophy of the part of the lung concerned, as it also arises through imperviousness of the other parts in inflammation of the small bronchial ramifications, after pneumonia, empyema, in thickly set crops of tubercles, hydrothorax, pneumothorax, after contraction of the chest in consequence of cavities in the lungs, and of pleuritis; partly, it takes place in a lung, if crude or miliary tubercles happen to be scattered through its substance, or if lobular pneumonia exist in the interior of the lung; whilst it may also take place at the commencement of organic changes of the heart, probably in consequence of the plethoric state of the lungs occasioned thereby.

Diminished intensity of the vesicular respiratory murmur, (*see* 333,) without its entirely disappearing, is a sign of pulmonary emphysema, (on inspiring forcibly, the respiration is heard,) of pulmonary œdema, of contraction of the bronchial ramifications, of pleurodynia, and pleuritis, in case the latter is restricted to the exudation of a thin pseudo-membranous layer. In these cases of pleuritis, the respiration appears to be removed to a distance from the ear. The cessation of the vesicular respiration takes place,—(1) if the air cannot reach to an otherwise healthy part of the lungs—this happens in inflammation of the small bronchial ramifications, adhesion of the same, in obstruction of them with mucus or with foreign bodies, in compression of them by enlarged lymphatic or bronchial glands, by aneurisms, &c.

(2.) The cause of the absence of the vesicular respiration may consist in this, that no pervious portion of the lung lies under the part of the thoracic parietes examined. Here two cases are possible; either the corresponding portion of lung is

impervious, or the lung is pressed back from the ribs. Under the former may be classed the grey and red hepatization, gangrene, apoplexy, melanosis, medullary sarcoma, hydatids of the lungs, in case they have attained a considerable extent, a condensed crop of tubercles, or tuberculous infiltration. By the lungs being removed from the wall of the chest, the absence of the vesicular murmur is produced in pleuritic effusions,* in effusions of blood into the cavity of the pleura, in pneumothorax,† hydrothorax,‡ and in medullary sarcoma of the pleura. In many of these cases, the vesicular respiration is replaced by the bronchial.

The greater the surface of thorax is over which the vesicular respiration is wanting, the more unfavourable is the prognosis, more especially in pneumonia, pleuritis, and hydrothorax.

332. In the normal state, the sound of inspiration exceeds that of expiration as well in duration as distinctness and audibility. The former increases uniformly in intensity to the middle of its duration, when it becomes gradually weaker, and, without making a longer pause, it passes into the sound of expiration. A deviation from these relations is a sign of disease. The expiration becomes longer, without attaining entirely the duration of the inspiratory sound, in the *respiratio rudis*. It takes place when smaller hepatized portions have formed in a portion of the lung, or crude tubercles are collected together in a place. It is one of the most important signs of incipient phthisis. The sound of expiration reaches the duration of that of inspiration in the bronchial respiration, more especially in the red and grey

* In all cases of effusion into the pleura, the respiration is totally extinct, except in those points where the lung is prevented receding from the ribs by adhesions. This total extinction of the respiratory murmur supervening in a short space of time, forms one of the most constant and remarkable signs of pleurisy. Empyema is further characterized by its chronic character, by dilatation of the diseased side, displacement of the heart, and inability to lie on the sound side, in which the respiration is puerile.—*Trans.*

† The tympanitic sound on percussion will help to distinguish this from effusion into the pleura.—*Trans.*

‡ Hydrothorax may be distinguished from empyema by its supervention in a leucophlegmatic habit, after symptoms of pulmonary obstruction or disease of the heart. In all cases of pleuritic effusion, the extinction of the respiratory murmur and the dull sound on percussion are first observed at the base of the thorax, unless when the effusion is circumscribed by adhesions, and thereby prevented from gravitating towards the diaphragm.—*Trans.*

hepatization, in pulmonary apoplexy, in pleuritis, in tuberculous infiltration, in thick groups of red tubercles, or tubercles just commencing to soften. In the cavernous respiration, the sound of expiration is longer than that of inspiration, as when cavities in the lungs are occasioned by softening of tubercles, by gangrene, or abscess, or by dilatation of the bronchi. The gradual increase and decrease of the inspiration is changed into the remitting and abrupt. The remitting inspiration (*r. entrecoupée*) is characterized by the inspiration becoming repeatedly weaker and stronger, before it passes into expiration, as though the lung made several exertions in order to complete the inspiration. It is observed in cases where crude tubercles are scattered through the lung in considerable numbers.

The abruptly ceasing inspiration, which follows the expiration after a long pause, indicates the presence of a cavity in the lung.

333. The sound of the respiratory murmur of the pulmonary parenchyma is in the normal state a fine crackling sound (*r. vesicularis.*) If it become blowing, as when the air passes to and fro through a canal, (in the normal state, this takes place in the trachea, and in the region of the third and fourth dorsal vertebra,) the respiration is called bronchial.* The condition of its occurrence is, absence of the vesicular murmur, and the proximity of a cavity, which is connected with the bronchi, to the thoracic parietes, or the presence of a good conductor of sound between the bronchial ramifications and the chest. Hence it has been observed in the red and grey hepatization, in pulmonary apoplexy, in pleuritic effusions, and in the accumulation of crude tubercles. It also appears when pulmonary cavities or large

* Bronchial respiration serves to distinguish pneumonia in its second stage from effusion into the pleura. When the crepitating r le and ordinary symptoms of pneumonia are succeeded by dulness of sound on percussion, by the expectoration of tenacious viscid sputa, and bronchial respiration, the disease may be set down as *hepatization*; when, after these symptoms, the sputa lose their viscid character, become liquid, and of a dirty brown colour, especially if the patient has had rigors, becomes hectic, and appears to sink, we may infer that the disease has passed into *purulent infiltration*.—*Trans.*

When the bronchial respiration is confined to the apex of the lung, and other symptoms indicate the development of tubercles, we may conclude with tolerable certainty of their existence. Bronchial respiration is likewise heard in *dilated bronchia*; this affection can only be distinguished by its chronic character, and by the absence of some of the usual symptoms of phthisis, such as h moptysis, night-sweats, or diarrh ea. —*Trans.*

bronchial ramifications lie near the thoracic parietes. There are individuals in whom the vesicular murmur over the entire chest evinces somewhat of a bronchial character, without any disease being present. If it appear only in one place, where in the normal state it does not occur, we may conclude on the existence of one of the above-mentioned diseases. The more extensive the place is, the worse is the prognosis. Sometimes the tone of the respiratory sound is similar to the respiratory sound in the larynx, as if the air passed into and out of a cavity (r. cavernosa). In these cases, one may conclude on the formation of cavities in the lung in the place in question, whether through tubercular softening, gangrene, abscess, or bronchial dilatation. The cavity is very near the surface of the lung when the tone of the respiration is of a puffing kind, and appears to the ear as if the air passed to and fro through the stethoscope. If to this puff there be joined a sound as if a thin moveable septum was between the cavity and the ear, and was moved by the ingress and egress of the air, (*souffle voilé*,) the edges of this cavity are of unequal thickness. In this case, the cavity is not occasioned by bronchial dilatation.

334. A pure respiratory sound is heard in all diseases where the bronchial ramifications are not affected, nor any fluids exist in them and the pulmonary cells. Respiration is impure if a new sound occur which is produced by the respiration, and only manifests itself with it. Under this head may be classed the rhonchi, which may be divided into the humid and dry. The former occur chiefly during inspiration, the latter in expiration alone, or in both. The humid resemble the noise made by small or large air-bubbles in a fluid. They are divided into the crepitating, subcrepitating, and mucous rhonchus.

The crepitating rhonchus is similar to the sound produced by the rubbing of hairs one against the other, or by sprinkling kitchen salt on red hot coals. It appears to the ear like the bursting of from twenty to forty very small bubbles during an inspiration. Its intensity is not considerable. It has been considered as a pathognomonic sign of the first degree of pulmonary inflammation. If it return in a hepated portion of lung, there is reason to hope for a re-establishment of the permeability of such portion.

The subcrepitating rhonchus appears with respect to the ear to be caused by larger and fewer bubbles (from five to ten), as compared with the crepitating rhonchus. It denotes œdema and apoplexy of the lungs, the first stage of acute bronchial

catarrh and bronchitis, the first and second stage of pulmonary tubercles and the grey hepatization.*

The mucous rhonchus is much more perceptible, more humid, and composed of fewer and larger bubbles, than the subcrepitating. It is most readily compared to the sound made by blowing air into soap and water. It proceeds from the bronchial ramifications in catarrh, hæmoptysis, and bronchitis; from pulmonary cavities, on the contrary, in pulmonary tubercles, gangrene, abscesses of the lungs, and bronchial dilatation. It is frequently audible at some distance, and sometimes produces a species of purring sound in the chest. In pneumonia and pleuritis, it is a sign that the bronchi have taken on them a part of the morbid process or the excretion of the morbid material; hence it is a favourable sign, if the strength hold good and the expectoration is easy. In bronchitis, it is of favourable import; on the contrary, in hydrothorax it is generally unfavourable, in as far as it mostly indicates a fruitless effort of the system to terminate the disease by the bronchial secretion. If the mucous rhonchus has extended over the entire lung, or over the principal part of both, its seat is in the bronchial ramifications. Where it is merely local, it originates in cavities.

335. The dry rhonchi are divided into two:—

(1.) The dry crepitating rhonchus, (*râle crepitant sec*, dry vesicular rhonchus.) It is similar to the sound caused by inflating a dry bladder. It indicates interlobular emphysema, and those cases of vesicular emphysema where certain of the pulmonary cells are considerably dilated.

(2.) The dry bronchial rhonchus, (*rhonchus bronchialis siccus*, *râle sonore*, and *râle sibilant*, two rhonchi distinguished from each other only by the height of the tone.) They are partly sonorous, partly sibilous, often like the singing of birds. They

* It may be observed, that pneumonia of the first stage, of which the crepitous rhonchus is a sign, usually occurs as an idiopathic disease; whilst œdema, on the contrary, supervenes on other diseases, especially such as have a tendency to dropsical effusions, always commences on the most dependent part of the lung, and the expectoration in it is composed chiefly of frothy serum. In *pneumonia*, again, the crepitous *râle* usually disappears on the second or third day, by the resolution of the disease, or by its passing into the stage of hepatization; whereas in œdema it sometimes continues for weeks, and changes its place according as the patient varies his position.—*Trans.*

With respect to pulmonary apoplexy, the bloody sputa will assist in removing the difficulty of the diagnosis.—*Trans.*

denote commencing catarrh, before profuse secretion has as yet taken place; the commencement of bronchitis; moreover, narrowing of the bronchial tubes, and pressure on the bronchi. In typhus and measles, they indicate the bronchial catarrh and bronchitis which so frequently accompany these affections. In pulmonary tubercles, they in like manner indicate complication with bronchial catarrh. If they pass into the humid sounds, expectoration is to be expected. They spread from the affected part of the bronchial ramifications over the entire chest; their original seat may be supposed to be where they are most intense and constant.

The Resonance of the Voice.

336. The sound of the voice extends just as well from the glottis downwards as upwards; but in the normal state it is not conducted onwards through the spongy substance of the lungs, and hence it is heard only in the trachea, in the region of the third or fourth dorsal vertebra, and in the larynx; in the latter more perfectly than in the former. Over all the remaining part of the chest the voice excites only an obscure buzz, and to the feel a gentle vibration. There are individuals, however, with broad chest and deep voice, in whom the voice resounds strongly over the entire thorax, without the respiratory organs being morbidly changed. Wherefore it is necessary here, also, to examine the entire surface of the thorax, at least the anterior surface, and to compare together the signs which the resonance of the voice yields over its different parts. It is only when the increased conducting of the voice is partial that it can be considered as a sign of disease. It takes place in two ways: either there is a good conductor of sound placed between the greater bronchial ramifications and the thorax, or the thicker bronchial branches receive an increase of width by the formation of cavities or by bronchial dilatation. Three species of morbid resonance of the voice have been distinguished, scil., bronchophony, ægophony, and pectoriloquy.

337. Bronchophony resembles the resonance of the voice as it is heard under normal circumstances at the third dorsal vertebra and at the trachea. The voice is not communicated so perceptibly that one can perfectly hear the words; one can merely hear how long the words last, where the accent lies on each, and whether the voice is deep or shrill. The tone of the voice is always somewhat modified, of which one may satisfy himself by comparing it with the voice as it comes from the mouth.

Bronchophony is a sign of the red and grey hepatization, of pulmonary apoplexy, melanosis, accumulation of tubercles in a part, of smaller cavities in the lungs, and moderate dilatation of the bronchial ramifications. It arises more frequently from these causes in the superior than in the inferior lobes, because in the former the bronchial ramifications are proportionally wider than in the latter, and tubercles occur more frequently in the superior than in the inferior lobes. It usually occurs in combination with bronchial respiration.

338. *Ægophony* is a peculiarly modified bronchophony; the voice is higher, shriller, and has as it were a silvery tone. It most closely resembles the bleating of a goat, (hence its name;) it is sometimes like the sound of a trumpet, or to be compared to the voice of Punch. If the two latter modifications are present, we have to compare the other signs before we can pronounce it *ægophony*, inasmuch as bronchophony also may admit these shades. From *pectoriloquy* it is to be distinguished by the indistinct transmission of the voice. It sometimes appears as if it did not pass through the stethoscope. It is, moreover, characterized in many cases by its change of place, on the patient's changing the position of his chest, and further by its being usually heard only on a line running horizontally around the chest, by the vesicular respiration being sometimes heard close to it, whilst the bronchial and cavernous respiration, on the contrary, are wanting. *Ægophony* is a pathognomonic sign of a fluid effusion into the cavity of the pleura, in pleuritis and hydrothorax. If the effusion be so great as to fill the entire cavity of the pleura, it is not heard. If it return in the later period of such a case, it may be looked on as a sign that the effusion is being absorbed. The level of the fluid is distinctly marked out by it; hence it serves very well to ascertain the increase and decrease of the disease. If it be heard over one entire half of the thorax, and not merely on a horizontal line, the lung is fixed to the thorax in such a manner that it cannot be removed far from it.

339. *Pectoriloquy* is characterized by the patient's words being distinctly understood, often better even than his voice from the mouth. In the normal state, an analogous phenomenon is observed in *laryngophony*. The voice is less distinctly heard in imperfect and doubtful *pectoriloquy*. By these shades *pectoriloquy* passes into bronchophony, even after the changes in the lungs, which are the causes of both, have attained a higher or lower grade. In doubtful cases, one may recognise *pectorili-*

loquy by the limited local seat, the accompanying cavernous respiration, and the entirely local cavernous mucous rhonchus. Pectoriloquy is a pathognomonic sign of cavities of the lungs connected with the bronchi. They may be occasioned by the softening of tubercles,* by gangrene,† or abscess; by the bursting of a serous cyst into the bronchial ramifications; or by considerable bronchial dilatation.‡ The more empty the cavity is, the freer its communication with the bronchi is; and the thicker its parietes are, the more perfect is the pectoriloquy, especially if the cavity is of a moderate size, and round. In very large cavities, it is doubtful, and passes into bronchophony, especially if the bronchial ramifications which open into it are very small. Sometimes it disappears if the bronchial ramifications which open into it are stopped up with the matter of expectoration. In this case, coughing restores it. If the cavity of the lung open into the pleura, pectoriloquy ceases. A cavity deeply seated in the lungs produces no pectoriloquy, unless its walls be considerably condensed.

The resonance of the cough presents similar phenomena; there is a bronchial cough and a cavernous cough, which present themselves under the same circumstances as bronchophony and pectoriloquy.

Signs from the Sounds of the Chest which are occasioned neither by the Respiration nor by the Voice.

340. The metallic tinkling (*tintement metallique*) is similar to the tone which is made by the falling of a drop of water, or of a grain of sand, into a metallic vasc. The condition necessary for its existence is, the combination of a gas and a liquid in a spacious cavity. This takes place (1) in very large pulmonary

* When pectoriloquy arises from tuberculous abscesses, the latter may be distinguished by their being preceded or accompanied by the usual symptoms of phthisis, and by their usually commencing at the apex of the lung.—*Trans.*

† Gangrenous abscess may be readily recognised by the fetor of the breath and sputa.—*Trans.*

‡ It is sometimes very difficult to distinguish dilatation of the bronchi from tuberculous abscess. We may, however, sometimes succeed in distinguishing dilatation of the bronchi by the length of time which the individual had previously suffered from attacks of chronic catarrh, and by the absence of some of the ordinary symptoms of phthisis, as hæmoptysis, &c.—*Trans.*

cavities, produced by tuberculous softening, and filled only in part with fluid ; (2) in pneumothorax, when it is connected with a fluid exudation into the pleural cavity. The manner in which the metallic tinkling takes place is accounted for in two ways, scil. : either a gaseous bubble ascends from below through the fluid, and bursts upon its surface, or a drop of fluid falls down from the upper part of the cavity. From the former cause, it appears to take place in those cases where it disappears on changing the patient's position, because then the communication of the bronchi with the pleural cavity comes to be situate over the fluid. Coughing and speaking produce it, when it has ceased for a moment.

341. The *bourdonnement amphorique* is closely allied to the metallic tinkling. It is like the buzz produced by blowing into a pitcher. It is occasioned by the free communication of the air in pneumothorax with the external parts, especially when the cavity contains but little fluid, and opens by several orifices into the bronchi. It is often found combined with the metallic tinkling.

342. The sound of fluctuation (*fluctuation thoracique*) is like the tone which is produced by the undulations of a fluid set in motion in a metallic vessel. It is a sign of pneumothorax with fluid effusion into the pleural cavity, or of very large tuberculous cavities containing a certain quantity of fluid. In the former case, it is heard only in succussing the patient ; in the latter, even when he coughs. The sound of fluctuation is frequently heard even at some distance from the chest ; the patient hears it in these cases. Whether it is indebted for its origin to a cavity in the lung or a pneumothorax will be ascertained by means of the sound obtained on percussion, or by the presence or absence of the respiratory sound in the part which fluctuates.

343. The sound of ascending and descending friction (*bruit de frottement ascendant et descendant*) presents itself to the ear as if a rough body was rubbed up and down the inner surface of the chest synchronously with the respiratory movements. This sound coincides as to time with inspiration and expiration, but is very distinct from the sounds of these. It is not connected with the respiration itself, but with the motions of the thorax ; it is most perceptible in deep inspiration, and frequently to be heard only in these. It presents itself (1) in interlobular emphysema, and in cases of vesicular emphysema where separate considerably enlarged air-cells project over the surface of the lungs ; (2) in pleuritis, if the inner surface of the pleural sac has

become rough from false membranes, and much fluid exudation is not present. Hence, in pleuritis it may be considered as a favourable sign, in as far as it denotes a moderate degree of disease. If the fluid exudation is considerable, the ascending and descending sound ceases.

344. The aneurismatic sounds are very like the sounds of the heart, particularly the rough sounds; they are distinguished from these by their seat at the upper part of the sternum, and from the wide extent of the sounds of the heart, by their abrupt, deep, rough tone, and also by this consideration, that the first aneurismatic sound is much louder than the first sound of the heart, or bellows sound, and decreases in intensity towards the heart; the second aneurismatic sound, on the contrary, is always stronger in this direction. If only a simple sound is present, the distinction is easy. These sounds are a pathognomonic sign of aneurisms of the aorta or its principal branches. Its place indicates the seat of the aneurism. If this rough saw-like sound is found to be very intense at the back, the seat of the aneurism is in the descending thoracic aorta, whilst the sounds of the heart, if they are audible there, become louder and rougher. If the aneurismatic sounds are heard in the upper half of the sternum and over the clavicles, at the same time more whizzing and more intense over the right, dilatation of the ascending thoracic aorta is to be suspected. They are most intense, and evince most of the rasping character, in dilatation of the aorta, especially when some parts have become cartilaginous and ossified. The tone is obscure and remote in old aneurisms. In many cases of aneurisms the sound is most intense on the side opposite to the sac. The sound is peculiarly loud, and so intense that it is heard at some distance, and by the patient himself, if a uniform dilatation of the aorta is combined with hypertrophy of the left ventricle without valvular disease. It is then heard to accompany the sounds of the heart. Vide 276.

Signs from the Vibration of the Chest.

345. In the normal state, loud speaking occasions a gentle vibration on the intercostal muscles. It is most distinctly felt on both sides and beneath the clavicles. In case of serous infiltration of the general integuments, it cannot be recognised. This vibration may be increased, be changed in quality, cease altogether, or occur without any connexion with the respiration and voice.

It is found to be increased over large cavities in the lungs, and in case of loud mucous rhonchus ; in the latter case, the respiration is sufficient to produce it. It becomes changed in quality in pleuritis, before any fluid exudation has yet formed ; one feels here synchronously with the inspiration and expiration as if two rough surfaces were rubbed one against the other. It is a very valuable pathognomonic sign for the first stage of pleuritis. Another change of the vibration is, the crepitating sensation in the interlobular emphysema, and in cases of vesicular emphysema, where separate immoderately dilated pulmonary cells form a projection over the surface of the lungs.

The normal vibration of the chest ceases when a perfectly impervious portion of lung lies against the ribs, as in the red and grey hepatization, or where the lungs are pressed back by solid, fluid, or gaseous substances, as in pleuritic exudations, hydrothorax, pneumonia, or medullary sarcoma of the pleura.

346. Among the vibrations not occasioned by the respiration or voice, may be placed the sensation of fluctuation in pneumothorax with fluid exudation, in large tuberculous cavities half filled with fluid, a phenomenon sometimes observed also in simple emphysema, when the intercostal spaces are very much arched outwards, or when the fluid by the forming of an abscess has made way for itself into the cellular tissue under the skin. Furthermore, under this head may be placed the purring sound, where it has its seat beyond the region of the heart, (*see* 268.) It denotes aneurysms of the great arteries in the chest, and nervous palpitations. It may be ascribed to the former, if it be confined to a small space over the sternal extremities of the clavicle, or to a tumour pressing through the ribs, if it decreases and increases in proportion to the frequency of the pulse, and is accompanied by aneurysmatic sounds. Where it is not constant, is proportioned to nervous excitement, and is spread over a considerable part of the chest and the neighbouring arterial trunks, without aneurysmatic sounds, it is attributable to nervous agitation. In dilatation of the aorta it is much more marked than in sacculated aneurysms ; in those of long standing it disappears entirely.

347. To the class of these phenomena belongs the pulsation at the chest, besides that in the region of the heart. The favourite places are, the ensiform cartilage of the sternum and the adjoining ribs, the region over the sternum, and that between the shoulder-blades. The pulsation over the sternum is a sign of aneurysm of the aorta, subclavian artery, art. innominata, and

carotid ; of enlarged glands which lie over the subclavian artery, of a varix of the jugular vein, of adhesion of the pericardium to the heart ; further, it is found to exist in nervous excitement, and has also been observed after severe losses of blood. In the two latter cases, the pulsation will be weak, and accompanied by a whizzing sound, not the rough, rasping sound, as in aneurysm. In adhesion of the pericardium, the stroke is more rapid, and the accompanying sound less rough than in aneurysm. In varix of the jugular vein there will be no aneurysmatic sounds ; the pulsation will be weak and tremulous, the tumour soft and compressible, and the jugular swollen by its compression. The pulsation which is propagated through swollen lymphatic glands is characterized by the absence of the rough sounds and the proportionally small disturbance of the circulation. Lastly, this independent pulsation will not be confounded with that produced by considerable hypertrophy of the heart, or by hydro-pericardium, whilst in the latter case the motion has only one centre, but in the above cases a space remains between the pulsating place and the site of the heart, at which no pulsation takes place, or a weaker one than at both ends of this space, namely, at the heart and over the sternum. A constant, firm pulsation, combined with the aneurysmatic sounds, indicates aneurysms. If it be over both sternal ends of the clavicle, and on the contrary not on the sternum, a dilatation of the aorta is the cause ; if this is limited to the ascending aorta, the pulsation will be stronger on the right side. In aneurysm of the carotid, subclavian, and innominate, the pulsation is only on the diseased side over the clavicle.

The pulsation at the upper part of the sternum and the adjoining ribs is produced partly by aneurysms, and partly by tumours which lie on the aorta. The presence of aneurysmatic sounds will be recognised as the cause in the former. Sacculated aneurysms of the aorta produce pulsation chiefly under the clavicles, at the sternum and ribs ; it is at the same time over the same, but weaker. Those of the ascending aorta produce pulsation principally at the sternum and over its right half. Sacculated aneurysms at the arch of the aorta, and at the commencement of its descending part, cause pulsation on the upper ribs of the left side, often towards the shoulder. Pulsation at the back, unless it is connected with the impulsion of an hypertrophied heart, indicates an aneurysm of the descending thoracic aorta.

Signs from the Form of the Thorax.

348. The form of the thorax varies according to age, sex, and temperament. The morbid changes of this cavity proceed partly from disease of the ribs and sternum, partly from that of the vertebral column, partly also from disease of the lungs, heart, and large vessels. This latter species has attained a peculiar semeiological import. In order to form a correct judgment, a comparison of both sides will be necessary.

Dilatation of one half of the thorax is connected either with diseases of the pleuræ (considerable pleuritic effusion, hydrothorax, pneumothorax, hæmatothorax, medullary sarcoma of the pleura,) or it is caused by vesicular emphysema extending over one entire lung.

Partial dilatations are a sign of pulmonary emphysema, especially if they occur on the anterior side of the chest along the sternum, of aneurysm of the aorta and arteria innominata if the region of the second and third ribs and of the ensiform cartilage be its seat, of hypertrophy of the heart and pericarditic effusion where the cardiac region is pressed forward. A projection of the short ribs is frequently a sign of enlargement of the liver and spleen.

A general narrowing of the entire thorax, as compared with the clavicles, which are of the normal length, marks the phthisical habit. In the course of consumption, this becomes still more apparent, in consequence of the emaciation, the partial pleuritic inflammations, and the tuberculous cavities.

Contraction of one side is a sign that pleuritis or pneumothorax had existed, and that the fluid is reabsorbed. Partial flattening of individual ribs is a frequent phenomenon in pulmonary tubercles, more especially under the clavicles. Approximation of individual ribs to each other is a sign of partial pleuritis, sometimes connected with diminution of a pulmonary cavity. On measuring the circumference of both halves of the chest, the difference between them is found to be much less than it appears to the eye.

Signs from the Percussion of the Chest.

349. The signs which may be obtained from percussing the chest are founded on the accurate comparison of the corresponding parts of both halves of this cavity. Here it is necessary

to take into account the varieties occurring in the normal state, according to the several places percussed. The sound on percussion may be more obscure or clearer than natural, or it may have acquired an accessory sound.

It is more obscure in the red and grey hepatization, through pleuritic false membranes and pulmonary apoplexy, in tubercles, when they are collected into one place, and have no large vomica formed in the vicinity of the thoracic parietes, in sarcoma, melanosis, hydatids, in gangrene of the lungs, through tumefied lymphatic or bronchial glands; lastly, through aneurysms. The sound on percussion is much more obscure, or, properly speaking, dull, in pleuritic exudations, in hæmatothorax and hydrothorax, through morbid products, which become developed in the costal pleura.

350. The sound on percussion becomes clearer in pneumothorax, in vesicular emphysema, and in large pulmonary cavities lying near the surface of the lungs; only, in pneumothorax, if it is connected with fluid effusion, the clear sound on percussion changes its place with the position of the patient.

A peculiar accessory sound, like that obtained by striking a cracked earthen vessel, (*bruit de pot fêlé*,) indicates pulmonary cavities lying near the surface of the lungs.

Though percussion affords no positive signs in diseases of the organs which convey the air, in cases where tubercles are but thinly scattered, in central pneumonia and apoplexy of the lung, still these signs are in many cases of great use for diagnosis by their negative results, more especially when taken in connexion with the signs obtained by auscultation.

Signs from the Quality of the expired Air.

351. Our knowledge with respect to the pathological changes of the expired air extends merely to its temperature and odour; pathological chemistry has not yet extended its researches to this subject.

The expired air is hot and burning in violent fevers, in inflammation of the lungs, and in bronchitis. The prognosis in these cases is always suspicious. Still worse is the cold breath, which precedes death in many diseases, especially in typhus, in bad cases of pneumonia, and of suffocative catarrh.

The changes of odour in the breath may proceed from the throat, mouth, or nasal cavities, as in ulcerations, caries, in scurvy, during the use of mercury, in cancer of the tongue, in

angina gangrænosa, &c. ; or they proceed from the stomach, as in persons who labour under indigestion, and in catarrhs of the intestinal canal ; in gastro-enteritis and helminthiasis it has a sweetish smell, in chlorosis it has the smell of new milk. A cadaverous breath in diarrhœa is a bad sign.

The change of the odour of the expired air may also have its seat in disease of the respiratory organs ; a foul breath denotes suppuration and gangrene in them, and hence in this case it is an unfavourable sign.

Signs from the Sensibility of the Chest.

352. A disturbance in the sensibility of the chest accompanies rheumatism, catarrhs, inflammations, suppurations, the formation of morbid products as well in the external parts as in those enclosed within the thorax. It manifests itself under the various forms of pain, among which pressure, weight, tension, &c., must be numbered. Pains in the back are a sign of tubercles, of Pott's disease, of rheumatism, sometimes of pneumonia ; they may also be connected with amenorrhœa and hysteria.

Pains in the sternum are a sign of a syphilitic inflammation of the sternum, of catarrh, bronchitis, of an inflammation in the mediastinum, and of pneumonia.

Pains in the sides are signs of pleurodynia, of pleuritis, of catarrh, of pneumonia, and of pericarditis.

Pains in the cardiac region indicate rheumatism of the heart, carditis, pericarditis, and endocarditis.

Superficial pains, unless they are occasioned by an inflammation of the general integuments, are a sign of pleurodynia, of syphilitic inflammation of the sternum, (more especially of the fixed pains which increase by night,) of catarrh of the bronchial mucous membrane, and of inflammation in the mediastinum. It is, on the contrary, deep-seated in pulmonary inflammation, and pulmonary tubercles.

353. If the thoracic pain is fixed, it indicates inflammation of the lungs, pleura, mediastinum, or pericardium. The wandering pain is a sign of pleurodynia, of hyperæmia of the lungs, of pleuritis, hydrothorax, and pulmonary œdema ; it accompanies the commencement of tubercular formation. If it extends from the cardiac region to the left shoulder and left arm, the diagnosis may be inflammation of the pericardium, or endocarditis. If it be seated chiefly in the right shoulder, disease of the liver, more especially hepatitis, is to be suspected. If

the pain increase by pressure on the part affected, the cause is inflammation of the general integuments, pleurodynia, pleuritis, or pericarditis. Pleurodynia is characterized by the pain being increased by the motion of the chest and arm. The pain in pneumonia and tubercles is not increased by pressure, unless inflammation of the costal pleura exist.

354. The intensity of the pain is not always proportioned to the severity of the disease and its danger; it is more in proportion to the vital power of the system, and the more or less abrupt appearance of the disease.

The pungent pain is a sign of an affection of the respiratory muscles and of the serous membranes; the tickling and cutting pain, of catarrh and inflammation of the bronchial mucous membrane; the simple pressing pain indicates pneumonia; the feeling of pressure, of weight, of tension, arises partly from a hepatized piece of lung remaining after pneumonia, from pleuritic and pericarditic exudations, hydrothorax, enlargement of the liver and spleen, partly from a congested state of the lungs in consequence of diseases of the heart and abdomen, (it consequently precedes spitting of blood and catarrhs,) as well as from chronic pneumonia in the first stage.

Signs from the Cough.

355. Cough is a violent, rapid, loud expiration. It indicates in general disease of the respiratory organs or irritation of their nerves. The disease may be idiopathic, and have its seat in the larynx, trachea and its branches, in the lungs, pleuræ and muscles of respiration; or it is sympathetic, through irritation of the nervus vagus with respect to the brain and spinal cord, in hysteria, or with respect to the abdomen in intestinal catarrh, and helminthiasis. The respiratory organs themselves may be affected primarily or secondarily through heart affection, suppression of hæmorrhoids or of menstruation, or metastasis to the bronchial membrane.

The semeiological import of the cough varies according to the phenomena preceding it, the duration and tone of the cough, and the expectoration.

356. Preceding tickling or pain in the larynx indicates catarrh, inflammation and ulceration of the larynx. If these sensations are in the air tube, the cause of the cough is to be sought in its morbid state. If the tickling is in the throat, or if hawking precedes the cough, disease of the pharynx is present,

(*tussis pharyngea*.) If it lie deep in the chest, disease of the lungs, heart, or pleura, is to be admitted as the cause, (*t. pectoralis*.) If the cause be in the œsophagus, the patient is made to cough on attempting to swallow, (*t. œsophagea*.) The cough is then very violent, constant, and dry. If irritation be excited in the epigastric region, if it is excited after eating, or removed by eating, it is called *tussis stomachalis*. In the *t. hepatica*, the irritation proceeds from the hepatic region; if morbid phenomena on the part of the small or large intestines have preceded, it is called *t. intestinalis*. If great anxiety precedes the cough, the *nervus vagus* is affected, as in hooping cough.

357. According as each separate paroxysm of cough consists of one cough or of a series of them, it bears a different import. The occurrence of the single cough-shock characterizes in particular pleuritis; in pneumonia also, at the commencement of catarrh, and in the crude stage of tubercles, the cough frequently evinces this quality. On the contrary, it comes on in paroxysms in attacks of asthma, in emphysema of the lungs, in catarrh with profuse secretion, in diseases of the heart, softened tubercles, hooping cough, ulceration of the larynx, in cerebral irritation, and hysteria.

If the cough intermits, nervous irritation with or without organic changes of the organs is the cause; this character is observed chiefly in nervous asthma, croup, hooping cough, in heart diseases, and in pulmonary emphysema; the hysterical cough, in like manner, is intermittent.

A continued cough is a sign of inflammation of the larynx, of the bronchi, lungs, pleura, and of pulmonary tubercles.

The remittent form, when the exacerbations occur morning and evening, denotes catarrh of the respiratory mucous membrane. It takes place after eating, if the respiratory organs are the seat of irritation and inflammation, in chronic pleuritis, tubercles, and congestions of the lungs.

358. The tone of the cough is very important for a knowledge of its cause. It is harsh in catarrh and ulceration of the larynx, barking in croup and hysteria. A whizzing cough without harshness is a sign of catarrh of the bronchial mucous membrane before the characteristic secretion has commenced, of bronchitis, of contraction and dilatation of the bronchi. The tone of the cough is of a hollow kind in asthma. Hooping cough is characterized by the loud, shrieking quality of the sound. The dry cough is that which ordinarily occurs at the commencement of catarrhs and inflammations of the respiratory

organs. It continues for the shortest time in acute catarrhs of the respiratory mucous membrane, longer in pneumonia, pleuritis, and in the dry chronic catarrh; it continues still longer, sometimes constantly dry, in pericarditis diseases of the heart, in many diseases of the larynx, in tubercles, hydrothorax, hysteria, and diseases of the brain. Long continued dry cough yields an unfavourable prognosis. The humid cough indicates the second stage of pulmonary catarrh and bronchitis; the humid chronic catarrh, suppuration and gangrene of the lungs, tubercular softening, the participation of the bronchial mucous membrane in pneumonia, pleuritis, or hydrothorax. The humid cough often indicates a metastasis to the mucous membrane of the air passages.

Signs from Expectoration.

359. A difficult expectoration at the commencement of acute affections of the respiratory organs, as long as the sputa are viscid, are of no unfavourable import; they become so, however, in the subsequent stage, whether the want of secretion or of power to discharge the secretion when formed be the cause. The prognosis is bad, especially in the latter case.

This takes place chiefly in extensive red hepatization and in grey hepatization, in gangrene of the lung, in suffocative catarrhs, and at the end of consumption. An easy expectoration is favourable in all diseases of the respiratory organs. Hawking indicates an irritation, a foreign body, a secretion in the throat or nose. It is painful and difficult in angina, without, however, making the prognosis unfavourable.

Signs from the Matter of Expectoration.

360. We ascertain the seat of the secretion by the place of the preceding irritation, and by the nature of the cough. The matter of expectoration is divided into three principal species,—viz., (1) a sero-muco-purulent substance; (2) blood; (3) solid bodies.

The sero-muco-purulent expectoration evinces great diversities in consistence, quantity, form, colour, smell, taste, temperature, admixture of air, and in the relief which follows it.

361. Thin fluid expectoration is occasioned by two different states: (1) the absence of fibrine or of albumen in the sputa, as in the serous expectoration, in that at the commencement of

catarrh, in many discharges of phlegm from the bronchial mucous membrane, characterized more especially in bronchial dilatation, pulmonary œdema, in chronic pleurisy, and in hydrothorax; the expectoration is then at the same time transparent and watery.

(2) Solution of the fibrine and albumen in gangrene and supuration in the lungs, and through tuberculous softening. The expectorated matter is then turbid and opaque. This species yields a very unfavourable prognosis. A moderately viscid somewhat thick (mucous) expectoration, is a sign of the second stage of acute catarrh, of bronchitis, of the resolution of pneumonia, and of many chronic forms of bronchial catarrh. A viscid expectoration, which continues partly to attach itself to the inverted vessel, indicates the first stage of pneumonia, as well as the beginning of the second stage of bronchitis and catarrh.

362. The quantity of the expectoration is small in the first stage of catarrh, bronchitis, and pneumonia; in the second, it increases to a certain degree, and then diminishes. It is rather favourable if in an acute disease of the respiratory organs the quantity continues for a long time small. Profuse expectoration in the second stage of acute affections of the respiratory organs is of favourable import. Sudden appearance of this profuse expectoration is occasioned by the opening of an abscess into the surrounding part, or of a gangrenous, tuberculous cavity of the lungs into the bronchi. It is accordingly of unfavourable import. Long continued copious expectoration gives reason to dread chronic catarrh and tubercles. If a profuse expectoration ceases suddenly under the appearance of fever, a new inflammation has supervened; if it coincide, however, with the occurrence of extreme debility, a small weak pulse, and gurgling respiration, great debility and danger of life are announced. Gradual decrease in its quantity, especially if other secreting organs evince at the same time exalted action, is of favourable import. Scanty expectoration is characteristic of diseases of the larynx and heart, as well as of all kinds of sympathetic cough.

363. Among the forms of the expectoration only two have attained a certain semeiological value, — (1) the globular-formed, pearly sputa; they are very viscid, and mark the dry chronic catarrh, the second stage of bronchitis; (2) the polypous sputa, which have taken on the form of the bronchial ramifi-

cations and air tubes ; they occur in croup and inflammation of the bronchial mucous membrane.

With respect to colour, the expectoration is distinguished into coloured and colourless. Want of colour is a character of the serous sputa ; this absence of colour is sometimes such that the sputa resemble glass. This colourless expectoration occurs chiefly in some forms of chronic bronchial catarrh, and in the first stage of tubercles. White opaque sputa are peculiar to the commencement of acute catarrh, and to pulmonary œdema ; yellowish white sputa are found in the second stage of acute catarrh, and in chronic catarrh with moderate secretion. Yellow expectoration sometimes characterizes chronic bronchial catarrh, also bronchitis, pneumonia, suppuration of the lungs or bronchi, and tuberculous excavations. Only in rare cases does the yellow colour denote disturbance of the hepatic secretion. Red expectoration occurs in consequence of the admixture of blood, (*see* 368.) The sputa become leek-coloured and of the colour of verdigrise from the admixture of blood that is changed. If they assume a brown-red colour, somewhat like the colour of liquorice juice or that of preserved damsons, they are a sign of the grey hepatization ; this colour but seldom appears in the first stage of pneumonia. In tubercular consumption, they are a yellowish grey and ash grey. The black colour of the expectoration may proceed from the bronchial glands, or from melanosis of the lungs ; it may also be occasioned by the inhaling of finely powdered charcoal, as in the case of labourers in coal-mines, and in persons who work by lamp-vapour.

364. A nauseous repulsive smell characterizes the puriform expectoration of many catarrhs, of chronic bronchitis, and especially of tubercular consumption in its second stage. It is also sometimes occasioned by suppression of an habitual stinking discharge, as for instance of sweating of the feet, and may also be mixed with the expectoration in the mouth, as in scurvy and bad digestion. The smell becomes cadaverous in gangrene and in suppurating cavities of the lungs ; it is accordingly of the most unfavourable import.

365. The expectoration excites a sweetish taste in the mouth of the patient at the commencement of tubercular consumption, in hæmoptysis, and in diabetic phthisis. It has, on the contrary, a saltish taste in the softening of tubercles, and sometimes at the commencement of bronchial catarrh. A more bitter taste indicates the bilious complication of pleuritis and pneu-

monia. The expectoration in the case of tuberculous cavities, gangrene, suppuration of the lungs, and pulmonary œdema, leaves behind it a nauseous taste.

Hot sputa are a sign of bronchitis and pneumonia; cold sputa prove the existence of great debility in suffocative catarrhs, and also of the grey hepatization and pulmonary gangrene.

A frothy expectoration is a proof that it came up not till after repeated paroxysms of coughing; this may be attributable to the scanty secretion, as at the commencement of bronchial catarrhs, of pneumonia, bronchitis, or may depend on the viscid quality of the secretion. In general, both causes co-exist.

366. The separation of the sputa is followed by relief in the second stage of catarrh, pneumonia, and bronchitis; on the contrary, in diseases of the larynx, the relief is inconsiderable, as also in the first stage of acute diseases of the respiratory organs. If the patient brings up little expectoration after long exertions, with but slight relief, and the continuance of the mucous respiration, the prognosis is bad.

367. The question how pus may be recognised in the expectoration has partly remained unsolved, whilst it has partly lost its practical interest. On the one hand, the sputa, according to their external characters, pass from the serous through the mucous into the purulent form, and the means given by Gruithuisen, Darwin, Grassmeyer, and Young, coincide in the extreme cases, whilst in doubtful cases they do nothing. On the other hand, it is now ascertained that mucous membranes can, without breach of continuity, secrete substances which perfectly resemble pus, as does the respiratory mucous membrane in many catarrhs. Lastly, many cases of pulmonary consumption occur without exhibiting puriform sputa.

368. The expectoration of blood affords, through the form in which the blood comes, according to its quantity, its mixture with air, its consistence, and the preceding and accompanying phenomena, important hints regarding the seat and cause of the bleeding.

According to the form of the sanguineous expectoration, it may be intimately mixed with the bronchial secretion, so that this appears to be uniformly rust-coloured. This is a pathognomonic sign of pneumonia. It is favourable if the blood disappears from the expectoration between the fourth and eighth day. A second form in which the blood is expectorated is in streaks and spots of blood. The streaky admixture of blood indicates catarrhs with violent irritation and bronchitis. The

expectoration is in these cases for the most part transparent, thready, and viscid. An admixture of blood in spots or patches indicates a very violent bronchitis or pneumonia, and also occurs in phthisis; it is therefore always an unfavourable sign. The spots (flecken) are commonly in a turbid copious expectoration.

A third form is hæmorrhage, or hæmoptysis; nothing is thrown up but blood, or at least this preponderates. It may exude from the bronchial mucous membrane, or be occasioned by rupture of a vessel, as in pulmonary apoplexy, tubercular softening, gangrene of the lung, opening of a cancer, or of an aneurysm in the air-tubes.

369. The quantity of the blood comes into consideration only in hæmoptysis. It may amount from a few drachms to several pounds; the more profuse the expectoration is, and the oftener it returns, the worse is the prognosis. Bleedings from the bronchial mucous membrane are commonly moderate in quantity.

Dark coagulated blood without froth is a sign of pulmonary apoplexy and phthisis. Frothy, fluid, rose-red blood may indicate those diseases, as also exudation from the mucous membrane. Fluid clear blood without froth in great masses comes from aneurysms.

370. If epistaxis has preceded the bleeding, and if the blood is hawked up, not coughed up, it comes from the nose. In habitual bleedings from the pharynx, it is in like manner hawked up; at a later period there probably occurs some cough, whilst at the same time the tonsils and velum palati are red and swollen. The blood may also come from the gums, as in scurvy. If there is first a tickling in the trachea, if menstruation or hæmorrhoids have been previously suppressed, if signs of any affection of the pulmonary parenchyma be wanting, the blood comes from the bronchial mucous membrane. If the hæmorrhage appears in the course of nervous fevers, the prognosis is bad. Hæmoptysis is also sometimes observed in scurvy. Frequently also heart-diseases appear to be the cause of bleeding from the respiratory mucous membrane, as also of apoplectic attacks. Spitting of blood, which is vicarious with menstruation or hæmorrhoids, presents no bad prognosis. If spitting of blood occur among signs of a pulmonary affection, it proceeds from the lungs; but whether apoplexy, tubercles, gangrene, or suppuration, be the cause of it, is to be ascertained from the history of the case and the actual signs derived from auscultation and percussion.

371. Solid bodies in the expectoration throw great light on the diagnosis; thus the discharge of pulmonary substance is characteristic of gangrene and tubercular phthisis, croupy membrane of croup. Small portions of tubercle are sometimes found, (whitish grey, friable, horny particles,) or softened tuberculous matter presents itself in the form of yellowish serpentine lines, which pass through a white, heavy sputum; the prognosis is then bad. The expectoration of cartilaginous particles indicates caries of the larynx or air-tube. Small stony concretions are a sign of the phthisis calculosa of Bayle or rather of the calcining of tubercles. If, however, they are tubular, they come from the bronchi. Hydatids discharged by coughing may have had their origin in the lung or liver.

Signs from the Voice and Speech.

372. The morbid changes of the voice and speech depend partly on diseases of the respiratory organs, more especially of the larynx, and partly on those of the brain. On the speech, the organs of the mouth and throat have also great influence.

The voice varies in strength and tone. In judging of the strength it is necessary to take into account the sex, mode of life, and constitution.

The voice becomes stronger in acute and chronic delirium. It becomes weaker even to the degree of aphonia under three different states of things, in consequence of diseases of the larynx, diseases of the brain, and debility of the respiratory muscles. Among the diseases of the larynx may be noticed inflammation, thickening, serous infiltration, ulceration and polypi of the mucous membrane, necrosis and caries of the cartilages, as also pressure on the larynx from tumours in its vicinity, particularly abscesses, wens, cancer, swollen lymphatic glands, aneurysms, &c. In this respect it is always an unfavourable sign.

The voice is very much influenced by the brain; it becomes tremulous and weak in acute cerebral affections; aphonia occurs in apoplexy; if this continue long, new attacks are to be apprehended. Hysterical aphonia does not make the prognosis bad, neither does that which occurs in epilepsy, catalepsy, and in helminthiasis. Debility of the respiratory muscles occasions aphonia in violent pulmonary inflammations, in gangrene of the lung, in typhus, diarrhoea, and the cold stage of fever; this kind of weak voice is, with the exception of that in the cold stage of

fever, of the most unfavourable prognosis, especially in diseases not seated in the respiratory organs. If the voice again becomes stronger without delirium setting in at the same time, the prognosis is favourable.

373. The tone of the voice may become higher, sibilous, hoarse, and hollow.

A high voice which sometimes becomes penetratingly clear and shrill, is a sign of spasm of the vocal ligaments, which is occasioned either by inflammation and ulceration of the larynx, or derives its origin from the nervous system, as in tetanus, epilepsy, hysteria, hydrophobia, and typhus. It becomes at the same time sibilous and tracheal in angina laryngæa, and Millar's asthma, with a barking, croaking character in croup; it becomes nasal on account of polypi of the nose and throat, as also from destruction of the velum palati and hard palate.

Hoarseness of the voice occurs in catarrhs, inflammation, ulceration, and thickening of the mucous membrane of the larynx. The longer the hoarseness continues, so much the worse. Pain in the larynx during the existence of hoarseness is unfavourable. In the acute exanthems and in nervous fevers it may be considered as dangerous. In pulmonary tubercles, syphilis, and lepra, it is a bad sign. A hollow voice occurs in nervous fevers, and in violent inflammations as a phenomenon announcing danger. In inflammations and ulcerations of the larynx, it has also been observed.

374. The speech becomes more rapid, and much hurried in delirium, in irritation of the brain, as for instance from gastric fever, in intermittent fever, before attacks of gout, and finally in mania.

Loss of speech arises either from local defects of the organs of speech, as inflammation, ulceration, hypertrophy, atrophy of the tongue, in consequence of too great length of the frænum, tumours in the lingual region, in angina tonsillaris, hysteric spasm, or through disease of the brain, more especially apoplexy, inflammation, hyperæmia, softening, and cerebral pressure. Where, therefore, no local diseases are the occasion of the loss of speech, and it is accompanied by signs of a cerebral affection, it yields an unfavourable prognosis.

375. Imperfect speech is in like manner either a sign of disease of the organs of speech, and of bad habit, or of irritation, hyperæmia, softening, inflammation of the brain and its membranes, of narcotism, cerebral pressure and tumours of the brain. It precedes apoplexy and delirium. Under the head of imper-

fect speech may be enumerated laborious utterance (barylalia), stuttering (balbuties), &c.,

Nasal speaking (paralalia nasalis), called, when in an extreme degree, paralalia palatina, depends on morbid changes in the guttural and nasal cavities, more especially angina, polypi, destruction of the soft or hard palate, and of the internal parts of the nose.

Signs from Yawning.

376. Yawning is a long, deep inspiration, with a wide opening of the mouth, followed by a short, strong expiration. It arises partly when a greater quantity of blood is to be oxidized on account of hyperæmia of the lungs, and partly when the vascular system requires a stimulus. By the first cause it is to be accounted for in congestions of the lungs, in the cold stage of fever, in the acute exanthems, before menstruation, hæmorrhoidal discharges, in disturbances of the intestinal canal, before hypochondriacal, epileptic, and arthritic attacks.

It arises from a want of a stimulus for the blood in states of profound debility, as after large wounds, in diarrhœa, after severe evacuations in general, particularly if, at the same time, the influence of the nervous system on the respiration and the blood is diminished, as in cerebral diseases, typhus, plague, and yellow fever. In the case of yawning after conception and before delivery, both causes seem to come into play.

Signs from Sighing.

377. Sighing consists of a long-drawn and deep inspiration and expiration; with the latter, a plaintive tone is commonly heard. It is a sign of hyperæmia of the lungs and brain. This is the cause of it in the cold stage of fever, in melancholy, before paroxysms of hysteria, as well as in functional disturbances of the intestinal canal. It precedes inflammation of the brain and its membranes, delirium, apoplexy, as also inflammation of the lungs.

Signs from Hiccup.

378. Hiccup is occasioned by a quick expansion of the thorax, with narrowing of the glottis, whereby a peculiar sound is produced. It seems to be a spasm of all the muscles which

assist in inspiration. The cause of this lies either in the intestinal canal or in the nervous system, more especially in the brain. It is accordingly found to exist in irritation, in inflammation of the stomach and intestinal canal, in peritonitis, in infarctions, in intermittent fevers, in hæmorrhoids and menstruation, in strangulated hernia, and in pregnancy. It proceeds from the nervous system in hysterical and hypochondriacal cases, after large bleedings, and in typhus. In abdominal inflammations, and in strangulated hernia, it presents an unfavourable import.

Signs from Sneezing.

379. Sneezing (sternutatio) is produced by a violent loud expiration after a deep inspiration, whereby the air is driven out through the nose and mouth. It is occasioned by a stimulus in the nasal cavities. This may be attributable to purely local diseases of the nasal mucous membrane, as in catarrh, inflammation or ulceration of this membrane. But other organs, also, may be diseased at the same time, and the nasal mucous membrane may either participate in the morbid process, or be only sympathetically irritated. In one of these two ways, sneezing takes place in diseases of the brain, particularly in sanguineous congestion, in inflammation of the brain and its membranes, in hysteria, and in typhus; also in diseases of the respiratory organs, especially catarrh, tubercles, and ulceration of the larynx; further, in pain of the face, in rheumatism of that part; it may also take its origin from the intestinal canal in gastric catarrhs and inflammations, worms, hypochondriasis, &c.

Long continued sneezing appertains to hysteria, and precedes its paroxysms. Accompanied by vertigo, tinnitus aurium, it precedes apoplexy; in inflammatory fevers, it sometimes precedes epistaxis. After apoplectic paroxysms, in obstinate paralyse, and in many chronic diseases, it is to be considered as a favourable sign.

Signs from Laughing.

380. Laughing is an expiration accompanied with a peculiar tone and distortion of the muscles of the face. This spasm of the entire muscles of expiration and of the face always indicates disease of the nervous system, more especially sympathetic affections of the brain. Morbid laughing is found to exist in

general in the nervous stage of fever, in hysteria, hypochondriasis, worms, in inflammation of the stomach and diaphragm, (in this case, however, only when delirium is present, or is impending.) In inflammations, it shews that the brain is involved, and yields on this account an unfavourable prognosis. It precedes and accompanies delirium and spasms.

Signs from Weeping.

381. Weeping, (fletus,) together with tears and a sorrowful countenance, is denoted by an interrupted or a very long-drawn expiration. It proceeds from the nervous system; in fevers, it accompanies delirium; in convalescence, it is a sign of extreme debility; it occurs in amentia senilis: in hysteria, or drunkenness, it does not render the prognosis bad, whilst, again, in old persons it may be looked on as a precursor of apoplexy.

VI.

SIGNS FROM THE SKIN.

382. THE state of the cutaneous organ exhibits changes in volume, consistence, contractility, temperature, colour, secretion, as also in sensibility and feeling; it may also be covered with eruptions.

383. The volume of the general integuments depends chiefly on the state of the cellular tissue beneath the skin. The volume is increased by hyperæmia of the cellular tissue and skin, by the deposition of fat, serum, or air, in the subcutaneous cellular tissue. Hyperæmia of the cellular tissue and skin is observed in the first stage of all violent fevers, more especially marked in the acute exanthems. If it cease suddenly without any cause, the prognosis is bad. So long as it lasts, the disease is to be considered as indeterminate. It appears local in inflammations of the skin and cellular tissue.

The deposition of fat is recognised by the uniformity of the increase in volume, the retention of the form of the body, the elasticity of the skin, and the integrity of the health. Unless it be excessive, in which case it is accompanied by sluggishness of

all the functions, it is still within the limits of health, but yet it disposes to dropsy and apoplexy. It is a bad sign when the size of the body in diseases does not decrease proportionably.

Increase of volume, through the deposition of serum in the cellular tissue under the skin, is recognised as such by the tension and shining appearance of the skin, and its want of elasticity. Anasarca takes place partly after skin diseases, more especially scarlatina, measles, and erysipelas; it is sometimes occasioned by disturbances of the circulation in diseases of the heart, veins, liver, spleen, lungs, in chlorosis, scurvy, after great loss of blood; sometimes it occurs in consequence of disturbance of the urinary secretion in diseases of the kidneys, or of the intestinal secretions, and at the end of neuralgic affections. When it occurs after skin diseases, the prognosis is not unfavourable.

If it arise from defects in the circulation or secretion, it may be considered as a bad sign, with the exception of that which occurs in chlorosis, or pregnancy, in consequence of pressure on the veins, and where it appears in convalescence after long confinement to bed. In all other cases, it is commonly connected with accumulations of serum in the serous sacs of the thorax and abdomen; its rise and fall affords a certain measure for the increase and decrease of these diseases. If the hydrothorax be the primary disease, the anasarca announces speedy death; in ascites, more especially of an inflammatory character, the prognosis is not so bad.

The effusion of air into the cellular tissue (emphysema cutanum) produces a shapeless increase of volume, without loss of elasticity, and with a tympanitic sound. The causes of emphysema are, (1) communication of the cellular tissue with the lungs or air passages; (2) the extreme degree of putrid fever.

384. Decrease of size, if it be occasioned by the first impression of a disease on the entire system, indicates its great severity. It appears to be less dangerous after violent evacuations and hæmorrhages. In the course of acute diseases, the proportional decrease of volume is normal, and may be looked on as a favourable sign. In chronic diseases, especially of the lungs, intestinal canal, mesenteric glands, and in ascites, it is a bad sign, especially when it occurs very soon.

385. The consistence of the skin seems increased where it becomes hard and tense, and diminished, on the contrary, when it is doughy and soft. These changes depend not only on the state of the skin, but also on that of the subjacent cellular tissue.

Increase of consistence commonly occurs with increase of volume. A tense skin, which, generally speaking, presents at the same time a shining appearance, arises—(1) from hyperæmia. The entire cuticle is tense and hard in all fevers, whether locally so from congestions in certain parts, or from inflammation of the skin itself. Thus the skin of the face is tense and shining in the case of congestion towards the head; a bad sign, where apoplexy or where delirium are to be dreaded, as in nervous fevers; (2) sometimes it arises from serous infiltration, as in many cases of anasarca, and in induration of the cellular tissue in children; (3) it is occasioned by the deposition of much fat in the cellular tissue; (4) by emphysema; it may be produced locally by tumours of all kinds under the skin.

386. The skin loses consistence in all diseases connected with emaciation, in phthisis, in the cachexiæ, and in fevers before and during the sweating. If the soft skin has also lost its elasticity, it is then said to be pasty. This state occurs in many cases of anasarca, and in acute diseases connected with extreme debility, as in cholera, nervous fevers, and violent inflammations.

387. The skin appears excessively contracted in the cold stage of fever, especially in that of intermittent fever; (this is the *cutis anserina*;) and relaxed in all diseases connected with debility and paralysis. The contractility of the skin is abolished in the cholera asphyxia, and in paralytic states of the brain and spinal cord. The abolition of the skin's contractility yields an unfavourable prognosis.

388. The temperature of the skin appears to the feel of the physician to be raised in all acute diseases connected with fever, more especially in inflammations; it is most raised in scarlet fever, and in the enteritis of young persons, (the *calor urens*.) A peculiar modification, constituting what is called the *calor mordax*, in nervous and bilious diseases, leaves a pricking sensation on the finger for some time. The *calor mordax* is also distinguished from the *calor urens* by this circumstance, that the former increases by allowing the hand to remain for some time on the skin, whilst the latter on the contrary seems to diminish. The heat is sometimes confined to particular parts, without the presence of any morbid process in these parts. This is a sign of hectic fever; in this case, the heat manifests itself in the palms of the hands and soles of the feet. Moreover, heat of skin in particular parts indicates inflammation of these parts or of a neighbouring organ.

389. Diminished temperature of the skin is to be felt in some

measure in the cold stage of fever and before hæmorrhages. The greater the cold is, and the longer the cold stage lasts, the more severe will the ensuing disease prove. If this cold state of the skin occur towards the end of acute diseases, or in chronic diseases connected with great debility, the prognosis is very bad. This is more especially to be found in cases where the function of hæmatisis or the circulation may suffer, or the evacuations are very violent, as in syncope, dropsy, chlorosis, chronic diseases of the abdomen, inflammation or irritation in the intestinal canal, and in diarrhœa; in cholera, apparent death, and frost fever, the cold of the skin attains the highest degree, and is a bad sign if loss of pulse is connected with it. The nose and extremities are soonest affected with cold; cold feet denote the commencement of many, even slight diseases.

Diminution of temperature in certain parts takes place from paralysis of the brain or spinal cord, interrupted circulation in these parts, and from a frozen state of the part in question. A return of warmth in the skin which had been cold is a favourable sign.

390. The colour of the skin depends partly on the state of the skin itself, partly on that of the vascular system and of the blood. It varies according to the race, age, temperament, mode of life, and the action of light and heat.

391. If the colour of the skin remains unchanged in diseases, it is a favourable sign, in as far as it denotes integrity in the state of the blood, and perfect nutrition of the parts not affected. But if other signs of a change in the state of the blood and of a disturbance of all the functions exist, a natural colour of the skin is a bad sign.

392. A sudden change of colour depends on the state of the vascular system, and mediately of the nervous system; it is found to exist—(1) in changeability of the distribution of the blood in passions and emotions of the mind, at the commencement of fever, in hysteria, and before the occurrence of menstruation; (2) in sudden sinking of the powers of life, when fevers, more especially the acute exanthems, become nervous; when an important organ passes into suppuration, or gangrene; or on the occurrence of some internal hæmorrhage. In these cases, if at the same time collapse take place, it is a bad sign.

Gradual change in the colour of the skin depends rather on the skin itself, and on the changes in the blood. Chronic diseases may be inferred from this. When the colour of the

skin changes in diseases which had hitherto continued local, this is a sign that the entire organism is now involved.

393. The white colour of the skin is observed—(1) when there is a preponderance of serum in the blood after profuse hæmorrhages, and in chlorosis; (2) in anæmia of the skin, the internal parts being in a state of congestion, as in the cold stage of fever, in irritation, inflammation, suppuration of internal organs, particularly in cholera, at the commencement of plague, and of the yellow fever, raphania, in paralysis, in the case of apparent death, in syncope, and in profuse secretions. A white colour of the skin in case of great internal heat and considerable debility is dangerous. If, in the acute exanths, the previously red skin become white, the prognosis is unfavourable. (3) In anasarca and deposition of much fat under the skin, or of tubercles in the skin and the subcutaneous cellular tissue in the elephantiasis græcorum. In these states, the skin assumes a peculiar shining appearance. This kind of white colour yields a bad prognosis if it occur in the face under circumstances where dropsy is to be dreaded.

If in convalescence the skin does not gradually recover its healthy colour, there is reason to apprehend that some chronic disease remains behind.

394. Redness of the skin spread generally over the body is observed to occur in febrile states, and more especially as precursors of the exanths. If it be a clear red, the prognosis is favourable; the dark red colour is unfavourable; it usually occurs in connexion with cerebral affections, with angina gangrænosa, and in internal inflammations. If a general redness be habitual, we must admit a disposition to inflammations and hæmorrhages, and in old persons to apoplexy.

Local redness of the skin is a sign of cutaneous inflammation, or of congestions towards the affected part of the skin, which are always accompanied with congestions towards the subjacent organs. Thus, in congestions toward the brain, the skin of the face is red; from this redness we may infer hyperæmia of the brain; it is a sign of the disposition to apoplexy, and precedes and accompanies the delirium of nervous fever. If the redness of the cheeks be circumscribed, there is reason to apprehend pulmonary tubercles. If the redness of a part of the skin continue, this part is either inflamed, or the capillaries are dilated in consequence of repeated congestions.

395. If the red colour of the skin depends on injection of the vascular system, its blue colour, on the contrary, seems to

be attributable to dilatation and fulness of the small veins of the skin, and imperfect oxidation of the blood. Disturbances of the circulation and respiration are the causes.

Thus this blue colour of the skin is found to exist in all heart diseases which impede the venous circulation through the lungs, and next in chronic inflammation of the lungs, in case of the fever of the acute exantheas assuming a nervous character, in cholera, and in the cold stage of intermittent fever. It yields a bad prognosis, especially in the two last-named diseases. If the blue colour is confined to the skin of the face, disturbance of the respiration through impeded entrance of air is the cause. If this be not quickly removed, the prognosis is bad.

396. The skin becomes of a leaden colour through a change in the composition of the blood in nervous fevers attended with a dissolved state of the blood, as in typhus, for instance, in phlebitis, in yellow fever, and plague, in cases of poisoning, (especially in the abdomen;) it also occurs in scurvy.

When the leaden hue of the skin presents itself locally, it indicates gangrene, unless it is connected with ecchymosis.

A livid circle around the eyes is a sign of debility; it is found to be temporary after every weakening influence, before menstruation, when this secretion is obstructed; it assumes a continued form in chronic diseases of the abdominal viscera.

397. The black colour of the skin is an aggravated form of the livid colour, and is observed in the extreme degree of scurvy, putrid fever, and typhus. A long continued use of nitrate of silver will also produce a black colouring of the skin. Some cases of black colouring of the greatest part of the skin, never of the entire, have been observed in persons whose health was undermined by old age, fatigue, bad nourishment, anxiety, &c. It may also follow great frights, great mental distress, in which latter cases the menstrual flux is generally stopped, or it may occur in pregnancy. It may occur gradually or suddenly; it may disappear, and return again in paroxysms. It sometimes continues, but mostly disappears under the form of desquamation and sweating.

398. The earthy, lurid colour of the skin is occasioned by its disturbed nutrition, not in consequence of idiopathic skin diseases, but of deep and serious disturbances in the respiratory organs, but more especially of the chylopoietic organs, in what are called cachectic diseases. It is observed in tubercles of the lungs and of the intestinal canal, in chronic diseases of the stomach, liver, pancreas, and spleen, as also in lead colic.

When cancer of an organ begins to act on the system, this colour also appears on the skin. In acute diseases, it appears only towards their termination, when the constitution of the blood is very much changed, as in typhus, plague, yellow fever, and softening of the lungs. It yields in general an unfavourable prognosis, and in chronic diseases announces the approach of consumption or dropsy, and in acute diseases a depraved state of the blood.

399. The yellow colour of the skin, or jaundice, occurs when the liver cannot secrete, nor the bile be excreted. It is accordingly observed in irritation, inflammation, degenerescence, medullary sarcoma of the liver, as in yellow fever, bilious fever, putrid fever, from sanguineous congestion of the liver in consequence of heart diseases, in case of obstruction of the ductus choledochus and hepaticus through inflammation, gall stones, or in consequence of worms, in consequence of pressure of tumours of the stomach, colon, lesser omentum, swollen lymphatic glands, also in irritation and inflammation of the duodenum. It occurs in a less degree, however, in hypochondriasis and melancholy. The bite of poisonous serpents occasionally produces jaundice. If other organs besides the liver and intestinal canal are not at the same time diseased, jaundice is not a dangerous affection. If there be an abatement of the symptoms with the appearance of the jaundice, the jaundice is favourable. If, on the contrary, there was before the jaundice a violent fever, if there be signs of heart or brain disease, or of pulmonary inflammation, the prognosis is unfavourable, except when in intermittent fever jaundice occurs at the commencement of each paroxysm. Jaundice in young persons is more favourable than in aged, because in the latter it is mostly occasioned by organic changes of the liver. If the yellow colour assumes every half-hour another shade, the prognosis is bad. If, simultaneously with the yellow colour of the skin, exantheas or petechiæ become developed, it is an unfavourable sign. If it extend from above downwards, it is more favourable than when it passes from the lower extremities upwards. In new-born children, the deep yellow colour, combined with disease of the stomach and brain, is unfavourable. If the yellowness of skin appear before the sixth day of yellow fever, it is a bad sign. When the skin repeatedly assumes a yellow colour in chronic diseases, the prognosis is bad.

400. The green and black yellow colour of the skin is only a higher degree of the yellow colour; it arises under the same

circumstances as the yellow, and becomes developed from the latter, if its causes are of long duration, and particularly if the spleen is also diseased.

401. Partial colouring of the skin is observed independently of the summer freckles, which are occasioned by the action of the sun on a delicate skin, more especially in liver freckles. The latter are longer than the former, of a saffron yellow colour, generally itchy, and combined frequently with desquamation of the epidermis. They are a sign of disease of the liver or of difficult menstruation; they also appear in pregnancy.

402. The secretion of the skin may be diminished and suppressed, or it is increased, the skin emits a vapour, and sweats, when the insensible perspiration appears in drops. The cutaneous secretion contributes but little to diagnosis, but much more to the establishing of a prognosis.

The skin is observed to be dry in the first stage of all acute diseases, more especially of the acute exanthems, and inflammation of the intestinal canal. If the dryness becomes very great and continues a long time, the prognosis is bad; in such a case, there is reason to dread the transition of the disease into the nervous form, or a fresh inflammation. The skin is found to be dry in all profuse secretions of other organs, as in diarrhœa, diabetes, cholera, phthisis, nervous fever, and dropsy.

403. The increased cutaneous transpiration is observed under two states: (1) as following the diminution of all the secretions, and consequently that of the skin, such diminution being produced by the first stage of acute diseases. In these cases, the prognosis is favourable, especially if the increase of the transpiration is general, the febrile symptoms become more mild, the pulse soft, less frequent, and full. Under such circumstances, the sweat is critical. If the sweat come after the first cold fit of an acute disease, still intermingled with the shivering, in which case the pulse continues hard and small, it then gives no relief, it is merely symptomatic. (2) It may follow other profuse secretions. If the strength keep up, if the other secretion is diminished, and if the morbid phenomena become improved on its appearance, the sweat is a favourable sign, as after simple diarrhœa, in cholera, diabetes, dropsy, and nervous fever.

If, however, the strength goes on declining with the appearance of the sweat, if other secretions continue, as diarrhœa for instance, and if hectic fever be present, the prognosis is bad.

404. General perspirations are more favourable than local, as the latter rarely possess a critical character. Very frequently

the local sweat appears on that part of the skin which corresponds with the internal organs affected. It occurs chiefly in diseases of the chest and abdomen, in angina, and in rheumatic and arthritic diseases. In these cases, the partial sweats sometimes give relief. In pulmonary consumption, local sweats on the head and breast are of unfavourable import. Sweats on one side of the body are observed to occur in some persons without any disturbance of health, whilst in other persons they have preceded dropsy. Habitual sweats are for the most part local, they occur very frequently in the feet, hands, parts of generation, fundament, and in the armpits. They are connected with diseases of the abdomen; their appearance seems to relieve the disease, whilst their cessation is of unfavourable import.

405. With respect to the prognostic import of sweating, it is very important at what period of the disease it occurs; it may be favourable even on the first day in catarrhal diseases, as also in those cases wherein a disease originated in suppression of the cutaneous transpiration; but it is generally of no use, and even injurious, in the first days of acute diseases. Sweats which continue for a long time in convalescence are unfavourable. Critical sweats occur mostly after midnight and towards morning.

406. The quantity of the cutaneous transpiration is very important in a diagnostic and prognostic point of view. Scanty sweating, where one had reason to expect it to be very profuse, is a sign of complication with some internal inflammation; this is more especially the case in the acute exanthems, in rheumatism, and in acute diseases of the intestinal canal. Moderate sweating is usually favourable. Profuse sweats are peculiar to miliary fever, to rheumatic and catarrhal diseases; they occur after spasms, and in these cases they have a favourable import. They seem to depend on active exaltation of function. But if these sweats are connected with debility, and afford no relief, as in diseases of the brain and spinal cord, in syncope, nervous fevers, in sweating intermittents, in phthisis, and some diseases of the kidneys, they afford an unfavourable prognosis.

Inconstant sweating presents itself under the same circumstances and with the same import as slight sweating. Transient, frequently returning sweats often precede the nervous change of fever. Profuse sweats are usually at the same time of a constant character.

407. The consistence of sweat should be somewhat viscid, and not entirely watery; in many diseases it becomes more viscid, in others it appears too watery. A viscid sweat is always

connected with debility ; thus it occurs after profuse hæmorrhages, in acute gastric diseases, in syncope, in putrid fever, in typhus, and in phthisis. It yields a bad prognosis only in those cases where the strength, according to the nature of the disease, cannot be reestablished. After hæmorrhages, in syncope, gastric fevers, and typhus, it accordingly affords no absolute bad prognosis.

A too watery sweat occurs on the one hand in the first stage of rheumatism, and sometimes of the acute exantheams ; on the other hand, it is observed to take place in hectic fevers, and in great debility, when gangrene of some internal organ has occurred.

Clammy and watery local sweats occur a short time before death in many diseases.

408. Warm sweats yield a favourable prognosis. Cold sweats occur (1) in mental affections, as in case of anxiety of mind ; it may be occasioned by mere physical influences, or through hysterical and hypochondriacal paroxysms, through great dyspnœa, as also in case of severe pain, as in that of colic ; (2) in consequence of the occurrence of great debility in the nervous change of fever, in cholera, hydrophobia, in consequence of the transition of internal inflammations into the state of gangrene, and in syncope. In these cases it is a fatal sign, more especially if it be at the same time partial and clammy.

409. Yellow sweats occur under the same circumstances as the yellow colour of the skin ; they are sometimes connected with critical phenomena, but sometimes they appear towards the unfavourable termination of hepatic degenerescences. Bloody sweats are either a vicarious secretion for other sanguineous discharges, such as menstruation, critical hæmorrhages, hæmorrhoidal bleeding ; they are then mostly local, and but slightly dangerous, or they are a consequence of a change in the constitution of the blood, as in typhus, plague, putrid fever, and scurvy. In these diseases, bloody sweats afford a very unfavourable prognosis. Milk-like, blue, and black sweats, have likewise been observed.

410. The odour of the perspiration is in the normal state somewhat sour. This sour smell increases in catarrhal, rheumatic, and arthritic diseases, in child-bed affections, in intermittent fevers, wherein it often resembles that of fresh bread, and in nervous fevers ; a sour smelling perspiration accompanies the miliary eruption. Acetic and lactic acids have been found in these sweats. In the last stage of phthisis, the sweat is some-

times sweet. In diseases of the kidney, and in gout, it contains uric acid. General sweats, emitting a stinking odour, (apparently containing ammonia on some occasions,) are a sign of change in the constitution of the blood, as in nervous fever, putrid fever, and phthisis; probably also those sweats observed in cases of disturbed menstruation, in diseases of the kidneys and bladder, in which the urinary secretion is disturbed, in gout also, in mania, and in melancholy, depend on this cause. Stinking sweats in febrile states yield a bad prognosis, except where they occur in connexion with favourable signs, and on critical days. In gout they are favourable. Local stinking sweats occur most frequently in the feet; they are connected usually with diseases of the intestinal canal or liver, with hæmorrhoids and gout.

In skin diseases, the insensible transpiration and the sweat assume a peculiar odour: thus, in *porrigo favosa* and *scutulata*, they take on the smell of cat's urine; in scabies, that of empyreumatic oil; in inveterate psoriasis, and in pityriasis, a mouldy smell; in oriental lepra, a goatish smell. Small-pox smells like herring-brine; syphilis has a sweetish smell.

411. Cutaneous eruptions come under consideration in a semeiological point of view only so far as they throw light on the diagnosis and prognosis of internal states. Exanthematous eruptions which set in with an alleviation of acute or chronic diseases are in general favourable. The miliary eruption presents itself in all diseases where the cutaneous secretions are very severe, the patient keeps himself very warm, bathes frequently, and takes heating medicines. It occurs with particular frequency in cases where the strength is sunk, in nervous fever, putrid fever, in typhus, diarrhœa, phthisis, after great losses of blood, in acute exantheams, as small-pox and scarlet fever, as well as in gastric complications of acute affections, and in diseases of the lying-in bed, as the milk fever and child-bed fever. Its prognostic import is to be regulated chiefly by the accompanying phenomena. The disappearance of the miliary eruption is a suspicious thing if the other symptoms become worse at the same time.

The furfuraceous eruption, which first appears on the neck, is, according to some, a sign of the transition of gastric fever into the nervous stage. Herpes is in general connected with diseases of the stomach, liver, and respiratory organs. Herpes labialis appears to be critical in diseases of the lungs, in intermittent fever, and sometimes in typhus.

Pemphigus frequently denotes gastric irritation. Pemphigus

gangrenosus, or infantilis, is a sign of great debility, and affords a suspicious prognosis.

Where urticaria occurs after eating crabs, dried fish, &c., the digestive organs are commonly affected. If it occur with each paroxysm of an intermittent fever, the prognosis is not rendered unfavourable by it.

A roseolar eruption in nervous fevers is a sign of typhus, and oftentimes of favourable influence on the prognosis.

The regular eruption and course of the scarlet and rubeolar eruption has a favourable influence on the prognosis; its repulsion is dangerous. The erythematous eruptions, especially the erythema nodosum, unless they are produced by irritants applied to the skin, are consequences of an acute or chronic disease of the intestinal canal.

Erysipelas presents itself as a favourable phenomenon in acute and chronic inflammations of the lungs, of the intestinal canal, and of the liver, in diarrhœa, in catarrhs of the respiratory and digestive mucous membranes, and at the critical period when menstruation ceases. The phlegmonous erysipelas seldom yields a good prognosis; it is sometimes developed in typhus.

Ecthyma is occasionally a critical phenomenon in acute intestinal inflammations; it is more frequently a sign of a cachectic state.

The porrigo favosa is a sign of a scrofulous habit.

412. Petechiæ are occasioned by an extravasation of blood into the cellular tissue of the corion. They occur in typhus, putrid fever, nervous fever, in the colliquative stage of tubercular phthisis, in scurvy, in the mercurial disease, in purpura simplex, and hæmorrhagica.

Black petechiæ are a bad sign in fevers, as are also vibices. If the petechiæ run together, if they come and go alternately, and observe no regular course, they are of a suspicious import. The appearance and disappearance of petechiæ derive their signification from the accompanying symptoms; they are sometimes critical.

A copper-red, and a round or a nearly round form, is peculiar in general to syphilitic eruptions of the skin.

Frequent furunculi are a sign of disturbance of the intestinal canal; in debilitated and gouty persons they are of frequent occurrence; they may also occur epidemically. Carbuncles are peculiar to plague, to the worst forms of typhus, and to affections of the spleen, and may also occur idiopathically.

413. Ulcers are frequently connected with internal states, and reflect much light on their diagnosis. Ulcers with a fungous, brown ground, and which bleed readily, with soft edges and an œdematous dark-red circumference, are peculiar to scurvy. Ulcers with callous, uneven edges, and a profuse serous secretion, appertain to arthritis. Uneven, and as it were undermined edges, an uneven ground with a cheese-like mass and considerable depth, are the characters of the scrofulous ulcer.

Hard edges and ground, with fungous excrescences that readily bleed, and a slight ichorous secretion, characterize a cancerous ulcer. The ulcer of scabies has a round form, or one consisting of several circles running together, a dark-red areola, a dirty ground, and pustules all around. Round ulcers on the lower extremities, with a ground bleeding periodically, and swollen veins along the circumference, are a sign of hæmorrhoidal and menstrual disturbances.

With respect to cicatrices, those are particularly characteristic which remain after syphilitic and scrofulous ulcers. In the former case, a hard, deepened cicatrix, generally connected with loss of substance, remains behind. The cicatrix after scrofulous ulcers is uneven, runs in several directions, and is somewhat elevated.

414. The sensibility of the skin may be exalted or diminished in diseases.

It is exalted in persons with a delicate skin, as also in irritation or inflammation of the spinal cord, in hysteria and hypochondriasis. It may be exalted over the entire skin, or only on some one portion of the same. If it be exalted in the skin of the lower half of the body, the cause lies in irritation of the spinal marrow.

The sensibility is diminished in several diseases of the brain and spinal cord, as in apoplexy, in softening of the brain, in mental diseases, after injuries of the head, and in all states where consciousness is lost, as in syncope, in apparent death, and in hysterical, hypochondriacal, and epileptic paroxysms.

415. Disturbances of the common sensation of the skin are the various species of pain, especially tickling, itching, the prickling and pungent sensation.

They are observed to occur (1) in most skin diseases at the orifices of the mucous membranes, and in irritation of these membranes; in the skin of the abdomen, in intestinal inflammations; in gout, in the affected part, before and after the paroxysm; (2) they may proceed from the nervous system, as in hysteria, hypochondriasis, before the fits in epilepsy, in inflammation and

irritation of the brain and spinal cord, in the case of worms, more especially the tape-worm.

In acute diseases, these sensations indicate the approaching occurrence of an exanthem, and in epilepsy and hysteria an impending paroxysm; if they occur locally at the orifices of the mucous membranes, one may infer the existence of irritation in this membrane; if at the rectum, hæmorrhoids or worms may be inferred; if at the nose, we may reckon on the approach of catarrh or epistaxis; and when at the glans penis, or clitoris, stone in the bladder may be suspected.

416. Formication precedes (1) the occurrence of the acute exanthems and of sweat, and may accordingly be accounted for in this way in fevers; (2) it is observed in irritations, inflammations, and organic changes of the brain, spinal marrow, and heart. In this way it occurs in raphania, in the case of worms, in nervous fever, and in tabes dorsalis.

SIGNS FROM INDIVIDUAL PARTS OF THE GENERAL INTEGUMENTS.

The Skin of the Face.

417. The skin of the face is of great importance in a semeiological point of view, as well for diseases in general as more particularly for affections of the head and chest. It is favourable when the face becomes changed in accordance with the other signs.

The volume of the face is increased through hyperæmia, cellular hypertrophy, and serous infiltration. In the first case, the colour of the face is red or violet-coloured, in the latter, pale. Hyperæmia is of an active or passive kind. The active hyperæmia, unless it is occasioned by erysipelas of the face, or the acute exanthems, is always accompanied by congestion towards the brain; it appears in all the more important febrile states, especially in inflammation of the brain and its membranes, and in inflammation seated in the neck. It precedes critical bleedings from the nose, the eruption of the acute exanthems, delirium and apoplexy. The accurate relation of time between the tumescence and detumescence of the face and that of the rest of the body in the acute exanthems is very important with respect to prognosis. Passive hyperæmia of the face is a consequence of disturbance of the respiration and circulation; it affords grounds

for dreading apoplexy and suffocation. The increased size of the face in scrofula and helminthiasis appears to be occasioned by hypertrophy of the cellular tissue under the skin.

Serous infiltration of the face arises under the same circumstances as general infiltration of the skin. Where it is not a consequence of skin diseases, it yields a very unfavourable prognosis.

418. The size of the face is very much diminished in consequence of all violent acute diseases, if congestions towards the head or disturbance of the circulation be not connected with them; it is more especially so in abdominal inflammations, in the cold stage of fever, in cholera, and in several cases of typhus. Decrease in the size of the face appears as a consequence of emaciation in tubercles, after severe discharges, intense mental exertions, after privations of every species; hence, unless the causes can be removed, it is of an unfavourable import.

419. Increased size of the top of the nose is observed in chronic diseases of the abdomen, as in infarctions, in hæmorrhoids, in disturbed menstruation, in hepatic diseases, in drunkards, in scrofula, also in acne rosacea; it is a sign of great obstinacy of disease.

Diminished size of the nose, wherein it appears pointed, takes place in extreme degrees of emaciation; this, therefore, as well as a pointing of the chin, is of unfavourable import. Sunk temples are the first sign of wasting, as for instance in consumption and acute diseases.

The eye-lids become very soon œdematous in dropsy; they are also very frequently the seat of abscesses. The size of the lips becomes increased chiefly through hypertrophy and degeneration of their cellular tissue in scrofula. Diminished size of the lips indicates an extreme degree of wasting in hectic fevers, after great losses of blood, and the other fluids of the body, or serious collapse of the strength in nervous fevers and in cerebral diseases, where it precedes delirium.

A swelling behind the ears, which passes rapidly into the state of suppuration, is of critical import in the acute exanthems. A swelling before the ear is a sign of swelling of the cellular tissue over the parotid, or of the gland itself. In typhus and plague they have a twofold prognostic value. When it occurs idiopathically there is reason to apprehend metastasis to the brain or testicles. Flaccid ears are a very unfavourable sign in nervous fevers.

420. The various colours of the epidermis are most developed

in the face; this part is also the best measure for those cutaneous colourings peculiar to the upper half of the body. The skin of the face becomes a clear red in erysipelas and the acute exanthems, as well as in all fevers, where there is a determination of blood to the brain, and especially in inflammation of the brain and its membranes, of the neck and respiratory organs, and in softening of the brain. Redness of the face precedes epistaxis, the eruption of the acute exanthems, apoplexy, and delirium. The face becomes of a dark-red or violet colour through disturbance of the respiration and circulation.

Paleness of face presents itself in acute diseases on the first impression of the disease on the entire system, as for instance, at the commencement of fever, in consequence of the action of miasms, after profuse evacuations, during the transition from a more favourable to a worse form of disease, as in gangrene, suppuration, and paralysis. In chronic diseases, it depends on chlorosis, dropsy, scrofula, and lingering diseases of the intestinal canal.

Frequent alternation of paleness and redness of the face characterizes inflammatory hydrocephalus.

In the extreme degrees of pale face occurs the dirty and earthy colour; one may infer from these the existence of constitutional disease of long standing and great obstinacy, more especially scrofula and tubercles of the lungs or intestinal canal, syphilis, gout, scurvy, purpura, degenerescences of the liver and spleen. The face acquires a yellowish tint in gastric and bilious diseases.

421. Congestive redness appears first, and in the most striking form, on the cheeks and on the ears. The violet colour of the skin, as well as the pale colour, are seen first and chiefly on the lips in bronchitis.

The clear circumscribed redness of the cheeks is a sign of a disposition to phthisis, or of its actual existence; in inflammation of the lungs it is darker and spotted; in scurvy it is formed by a fine venous network. The violet, dirty pale, lead-coloured rings around the eyes precede the extension of these colours over the entire face, and denote the lower grade of those morbid states indicated by the dirty pale and earthy face.

The copper-red colour of the nose is connected with morbid states of the abdomen, more especially with chronic diseases of the liver, with chronic irritations and inflammations of the intestinal mucous membrane, and with hæmorrhoids. It accom-

panies *acne rosacea*. A pale nose in fevers and in consumptions is an unfavourable sign, as also a blue nose in cholera, typhus, and ague. In moderate ague, however, in spasms, and in scurvy, it may be bluish without having an unfavourable import.

The leaden colour in the fold between the nose and cheeks is a sign of disturbed respiration and circulation from causes of long standing, as in hydrops pericardii and hydrothorax, in pleuritis, from organic changes of the heart, in pulmonary tubercles and in hepatization of the lungs.

422. The temperature of the skin on the face has, beside the indications which appertain to the entire skin, some of a peculiar character. Coldness of the face is observed to be a dangerous sign in inflammatory diseases, more especially in inflammations in the chest, or abdomen, where the rest of the body is warm. The difference between the temperature of certain parts of the face is still more unfavourable, more especially heat of the forehead and coldness of the cheeks, as is observed in hydrocephalus and Asiatic cholera. The forehead becomes cold and pale after severe losses of blood, in fainting, in the cold stage of intermittent fever, and before spasms. The nose becomes cold first. Temporary heat and redness is observed on both or only on one cheek in hysteria, in the climacteric years, and in consumption. Heat and redness of one cheek, whilst the other is cold and pale, gives reason to infer the existence of a nervous fever.

423. The secretion of the lips has similar diagnostic and prognostic import to that of the tongue and gums. They become dry in all fevers and in spasmodic paroxysms. A mucous white coating is a sign of irritation or inflammation of the intestinal canal; accordingly, this coating is found in mucous obstruction, in gastric intermittent fever, in mucous fever, and before the gouty paroxysm. A dry brown coating of the lips is a sign of colliquation in consequence of a typhous affection; it is accordingly observed in typhus, in putrid fever, in acute exantheas, and inflammations which have become nervous.

Of the eruptions, *mentagra* belongs exclusively to the chin; herpes in consequence of gastric and intermittent fever to the lips and the parts around the nose; the forehead is more particularly the seat of the syphilitic eruption; the region behind the ear that of *porrigo*. The different kinds of *acne* occur frequently, on the face more especially.

Signs from the General Integuments of the Neck.

424. The epidermis of the neck appears swollen, partly through an accumulation of blood, as in serous obstructions of the circulation, in consequence of diseases of the heart, lungs, and larynx; in severe forms of angina, (in the latter case, the prognosis is unfavourable,) partly in consequence of emphysema, which presents itself most frequently in the neck, partly from enlargement of the organs of the neck, as from wen, accumulation of fat, fungous tumours, swelling of the lymphatic glands, from abscesses, hernia trachealis, pharyngocele, and aneurysm of the carotid. If the size of the neck decreases in inflammations of the organs of the neck, the prognosis is bad.

Rapid emaciation of the neck is, in chronic diseases, an unfavourable sign, for the disease is already far advanced.

Respecting the signs from the abdominal and thoracic integuments, see the Signs from the Respiratory Organs and the Digestive System.

Signs from the General Integuments of the Extremities.

425. Increased size of the general integuments of the extremities is occasioned by fat, serous infiltration, and emphysema; on the lower extremities also by a varicose state of the veins, and elephantiasis. Œdema of the lower extremities indicates more especially disturbance in the return of blood to the heart, and is therefore most frequently met in diseases of the liver, heart, and spleen; and next in all cases where tumours in the abdomen disturb the circulation; and lastly, in all dropsies of the abdomen. In acute diseases, œdema is observed in the feet, after long lying, without the prognosis being thereby rendered unfavourable; in diseases of the heart, in hydrothorax, and in consumption, it is a sign speedily fatal. A swelling of the thigh alone as far as the inguinal region, with pain and a tolerably firm consistence, is a sign of phlegmasia alba dolens.

Serous infiltration of the upper extremities is connected more with diseases of the heart and lungs than with those of the abdomen; it more particularly accompanies œdema of the lungs, hydrothorax, extensive hepatization, and tubercles of the lungs; also hydropericardium, pericarditis, narrowing or widening of the orifices and cavities of the heart, as also aneurysm of the thoracic aorta. Swelling of the extremities, with redness of

the skin, denotes erysipelas, pseudo-erysipelas, inflammation of the veins and arteries ; on the fingers, panaritium.

The ends of the fingers become knobby in the blue disease, and in scurvy. Wasting of the extremities bears the import stated under the head of atrophy of the muscles.

426. Blue or violet colouring of the extremities, more especially of the points of the fingers, denotes, when it is not produced by the blue disease or scurvy, disturbance of the circulation produced by the cold stage of fever, and cholera ; it then indicates a violent disease.

Coldness of the extremities in nervous fevers, in abdominal inflammations, and at the termination of chronic diseases, is a bad sign ; on the contrary, in the cold stage of fever, and in spasm, it has not this unfavourable import.

Of the cutaneous eruptions, those which principally attack the extremities are eczema, lepra, lichen, and psoriasis ; the latter ordinarily confines itself to the side of the limbs corresponding to the extensors.

Signs from the Nails.

427. The nails suffer, in general, morbid changes in the same cases as the other parts appertaining to the horny structure. These changes are caused partly by morbid processes, which act chiefly on the skin and hairs, as lepra, elephantiasis, psoriasis, plica polonica, or diseases such as syphilis or arthritis involve the same parts sympathetically in their advanced stage ; again, there are morbid states of the blood, as in the blue disease, many forms of phthisis and chlorosis, which occasion changes of the nails.

They become thickened in all diseases which in general attack the horny structure ; at the same time, they either grow out in a straight direction, as in gout and syphilis, or they become curved and claw-like, as in plica, lepra, psoriasis, and elephantiasis. They become not thickened, but merely broad and strongly curved, in the blue disease and consumption, and under the root of the nail there is found a serous or gelatinous exudation. In these cases, as also in ague and cholera, their colour becomes blue ; in chlorosis and dropsy, white. Softening of the nails is peculiar to chlorosis. This may also be occasioned by syphilitic inflammation. Swelling of the matrix of the nails occurs through inflammation, which may be occasioned by syphilis, gout, lepra, or plica polonica.

Falling off of the nails occurs in consequence of these inflammations, also in elephantiasis, after scarlet and nervous fevers; they become scaly in lepra, plica, and in females who do not menstruate regularly.

Signs from the Hairs.

428. The hairs become morbidly changed, partly through general defects of nutrition, partly through local inflammation of the hairy skin and of the bulbs of the hairs, and lastly in consequence of plica.

If the hairs turn grey before the ordinary time, it is an abnormal phenomenon. It is often very rapidly produced by the depressing passions, also after lingering difficult diseases, and after excesses; it is a common occurrence in many families.

The falling of the hair in consequence of disturbances of nutrition is usually general, or at least extended over a great part of the hairs, as in advanced life, after severe diseases, such as typhus, after acute exanthems, in phthisis, elephantiasis, the mercurial disease, constitutional syphilis, after excessive indulgence in venery, great mental exertion, depressing passions, violent and long continued head-aches, and in case of disturbed menstruation. Like premature greyness, it is hereditary in many families. After nervous fevers, the hair commonly grows again.

The falling of the hairs of the head in different spots is mostly a consequence of the various species of porrigo, of syphilis, and of the mercurial disease; in the hair of the beard it occurs from sycosis menti; castration, in like manner, produces the falling of the beard. The eye-lashes and eye-brows fall off in consequence of herpetic, variolous, scrofulous, and syphilitic ulceration. A deficiency or absence of hair on the genitals after puberty indicates retarded development.

An excessive growth of hair is observed in phthisis, and in men who have grown up without covering. Development of hair in places where it does not otherwise grow is observed on the chin and upper lip of females whose menstruation is irregular, and who possess a masculine habit of body. An abnormal direction of the hairs takes place in inversion of the cilia. Dryness of the hairs and splitting of their extremities precedes their falling off. The opposite state, namely, swelling of the ends of the hairs, with the separation of a viscid fluid, is a sign of plica.

The hair presents a want of lustre in chronic and acute diseases which are taking on an unfavourable termination, as typhus, dropsy, and phthisis.

VII.

SIGNS FROM THE URINARY ORGANS.

Signs from the Urinary Excretion.

429. THE morbid changes of the urinary excretion are referrible partly to local diseases of the organs to which this function is assigned, and partly to diseases of the brain and spinal cord. The excretion of urine may become difficult and cease, it may be withdrawn from the will, it may become painful, or lastly, the urinary stream becomes changed.

430. With respect to the difficulty of voiding the urine, three grades are distinguished—scil., dysuria, where a great effort must be made in order to empty the bladder; strangury, wherein a powerful pressure is necessary in order to force out the urine by drops; and ischuria, wherein no urine can be passed.

The two first species, dysuria and strangury, are occasioned either through diseases of the bladder or urethra, or the fluid to be excreted puts obstacles in the way.

Weakness of the bladder, excessive sensibility, catarrh, inflammation and ulceration of the same, spasm, more especially at the neck of the bladder, fungous growths, polypi of the vesical mucous membrane, are frequently the causes of difficult urinary excretion. If it is caused by pregnancy, prolapsus of the uterus, rectum, or hernia of the bladder, it ceases by change of position. If it is occasioned by stone in the bladder, it ceases in the supine position; in case of hypertrophy of the middle part of the prostate, in case of polypi and fungus at the neck of the bladder, by bending forward at a right angle. With respect to the urethra it occurs in irritation, inflammation, thickening, and ulceration of the mucous membrane, through swelling of the prostate, cicatrices, varicose state of the urethra, and compression of this tube by various tumours. The secretion itself is sometimes the occasion of it, in the case of stone,

by the admixture of sand, pus, blood, mucus, and lastly by the irritating quality of the urine itself. Dysuria is sometimes occasioned by a critical catarrhus vesicæ in mucous fevers, typhus, and bronchial catarrhs.

Perfect ischuria is divided, according to the seat of its cause, into the ischuria renalis, ureterica, vesicalis, and urethralis; the two former are included under the spurious, the two latter under the true.

Ischuria renalis (wherein no urine is secreted) is recognised by emptiness of the bladder, the absence of any swelling in the region of the ureters, and the accompanying signs of an affection of the kidneys. It appears either in idiopathic affections of the kidney, as inflammation, suppuration, degenerescence of both kidneys, and a dilatation of their veins; or it is of sympathetic origin, as at the commencement of inflammatory fever, in affections of the brain and spinal marrow; in this case, it frequently precedes apoplexy and serous effusions.

From this, which is properly ischuria renalis, we must distinguish that form which occurs in consequence of obstructions to the discharge of urine in the ureters, and from obstructions in the pelves of the kidneys, without the urinary secretion being disturbed. This species is occasioned by inflammation, abscesses, and scirrhus, or through stone in the kidney, hydatids, mucus, and clots of blood. These states may exist simultaneously in both kidneys, or only in one, and the other is sympathetically irritated, or its ureter is closed.

The ischuria ureterica is recognised by the emptiness of the bladder, the absence of signs of a kidney affection, and the swelling of the ureters which is sometimes to be felt through the abdominal integuments. Spasm, inflammation, and suppuration of the ureters may be the cause; they may be compressed by morbid growths, or tumours of the surrounding organs; also, their opening into the bladder may be closed up in consequence of thickening of the parietes of that viscus.

Ischuria vesicalis and urethralis may be occasioned either by similar local causes, as strangury, or by spasm, or through paralysis proceeding from the brain and spinal cord, as well in idiopathic diseases of these organs, more especially hydrocephalus, injuries of the cranium, pressure from extravasated blood, as in hysteria and typhus. Lastly, pressure on the nerves leading to the bladder in like manner produces ischuria vesicalis. In typhus, and in diseases of the brain and spinal cord, ischuria is of unfavourable import.

431. Inability to retain the urine (incontinentia urinæ, enuresis) presents various grades ; either the patient may retain small quantities, or the urine is constantly passing off. This state may be occasioned through ulceration at the neck of the bladder, as well as in consequence of a foreign body in it, which keeps it open, without entirely obstructing it. Most frequently, however, it is a sign of paralysis of the neck of the bladder through general debility, as in aged persons, in consequence of previous ischuria, affections of the brain and spinal cord, and in fevers. In the latter cases, the prognosis is bad. In the lesser grade of this affection, where the patient is obliged frequently to void urine, the cause, unless the urine be secreted in excess, must be irritation of the bladder through acrid urine, catarrhus vesicæ, inflammation of the bladder, kidneys, urethra, and the neighbouring organs ; or the bladder is affected with spasm, as in hysteria and hypochondriasis ; or lastly, in consequence of smallness of the bladder. The involuntary passing of urine in case of loss of consciousness in epileptic and hysterical attacks, in the profound sleep of children, in delirium and coma, is to be distinguished from this. It only renders the prognosis bad when it is combined with coma and delirium.

432. Pain in passing the urine is combined with dysuria or strangury, and is a sign that these are occasioned by irritation, inflammation, or by ulceration of the bladder or urethra. Sometimes, however, the pain depends on an inflammation of neighbouring organs, as of the uterus, vagina, and peritoneum.

A change in the stream of urine, where it is curved, cork-screw-like, thin, cleft, &c., is a sign of stricture of the urethra.

Signs from the Examination of the Urinary Organs.

433. The increased size of the kidneys may be ascertained, though imperfectly, by percussion, as also by the feel, when the region between the lowest ribs and the crista ossis ilium is pressed forwards, the thumb being placed anteriorly. The sensibility of the renal region is much more important in this process ; if it give rise to pain, inflammation or ulceration of the kidneys is to be suspected, or stones in the kidneys exist. The ureter, when it is swollen in ischuria ureterica, may be felt as a thick string in the inguinal region.

A dull sound in the region over the pubis is a sign of a full bladder. Pain in this region is a sign of over-filling, of irritation, inflammation, of ulceration of the bladder, and of stones in

this organ. The presence of strictures, of enlargement of the prostate, of stones in the bladder or urethra, may be ascertained with the catheter and bougies. Swelling of the prostate is best detected by examination through the rectum.

Signs from the Urine.

434. The urinary secretion, with respect to quantity, is very closely connected with the state of the nervous and vascular system, and in other respects with the vegetative system; more especially the chemical composition of the urine depends on the latter. Besides the phenomena which chemical re-agents produce in it, it manifests itself by changes of colour, consistence, smell, taste, and sediment.

435. The quantity of the urine, even within the limits of health, evinces considerable varieties according to the age, time of day, the quantity and kind of drink taken, and the state of the other secretions. In diseases, the quantity of the urine is changed partly through idiopathic affections of the kidneys, partly through general changes of the vital process, and the increase of serous secretions in other organs.

The quantity of the urine is increased in case of suppression of the cutaneous and pulmonary transpiration, in the cold stage of intermittent fever, in hysterical and hypochondriacal paroxysms; it is most remarkably so in diabetes. In apoplexy, an increased secretion of urine, in case it is not combined with general debility, should be deemed favourable. In dropsies, if the strength hold up, and the effused serum diminishes, it yields a good prognosis. In typhus, the escape of a great quantity of colourless urine is bad.

Diminished quantity of urine occurs in all cases enumerated under the head of ischuria renalis and ureterica, as also when there is an increase of the cutaneous and pulmonary transpiration, in profuse serous diarrhœa, as for instance, in the Asiatic cholera, in dropsies, in pregnancy, in active hæmorrhages, in the inflammatory stage of fever, and in convulsions. Scanty urine after acute exanthems, after inflammatory chest affections, is a forerunner of anasarca and hydrothorax. In inflammations, the suppression of the urinary secretion is a sign of great violence. In typhus, the too small quantity is equally unfavourable.

436. The chemical composition of the urine varies very much according to age, sex, diet, state of mind, &c., in the healthy state. In diseases, the normal constituents sometimes exhibit

deviations in the quantity, whilst on other occasions new substances enter into it. Through these, the colour, consistence, smell, and taste of the urine, its sediment and its habitude to chemical re-agents, undergo manifold changes.

437. The urine is colourless, in small quantity, of solid constituents, in diabetes insipidus, dropsy, and in every increase of the urinary secretion without critical import, as in the cold stage of fever, hysterical and hypochondriacal paroxysms, in hydrophobia, and in violent inflammations, especially of the brain. In inflammations, an unfavourable import is ascribed to it.

The white urine derives its colour from the admixture of mucus, lymph, and pus. It is accordingly found to exist in ulceration of the kidneys and bladder, in catarrhus vesicæ, and in stone. Mostly, however, the white colour of the urine is connected with a general solution of the solid parts, a process which extends over most of the secreting organs, whereby mucus is secreted in abnormally great quantity, as in mucous fever, many cases of child-bed fever, in recent delivery, gastric catarrhs, hæmorrhoidal states, scrofula, worms, and in consequence of the influence of mercury. In arthritis, also, the urine becomes sometimes white. The same thing has been observed in croup and hydrocephalus.

The dark-red urine is observed in inflammations, ulcerations, hæmorrhages of the bladder and kidneys, and in case of stones in these organs; as also in typhus, putrid fever, scurvy, in hectic fevers, and in very severe inflammations. It partly acquires this colour through admixture with blood. It should be always considered a suspicious sign.

The yellow-red urine (*urina flammea*) is at the same time scanty and indicates the occurrence of fever in inflammations and in rheumatism. Where it continues long, it is a sign that the disease will not soon terminate. In chronic diseases, one recognises by them the inflammatory complication, or the commencement of hectic fever. In intermittent fever, it accompanies the sweating stage.

The yellow urine occurs in diseases of the liver, in diabetes mellitus, in gastric, intermittent, rheumatic, and hectic fevers.

The urine becomes green in diseases of the liver, more particularly in inflammation and the several species of degenerescence of this organ, in obstruction of the biliary ducts, and in bilious fever. (It contains the constituents of bile.)

The brown and black urine appears in most cases to be occasioned by the admixture of blood; it is observed in inflam-

mations and suppurations, the formation of stones in the urinary organs. after the suppression of menstruation and hæmorrhoids, in melæna, melancholy, hysteria, degenerescence of the liver, and spleen; in many of these cases, as in melancholy, in long continued obstructions in the abdomen, it is sometimes favourable. On the contrary, in typhus and in yellow fever it presents the most unfavourable import.

438. Deviations in the consistence of the urine are a further sign of its changed composition. It becomes too watery under the same circumstances wherein it becomes colourless, and also in the stage of increase of acute diseases. It is then at the same time clear. A thick turbid urine, where it is not occasioned by local diseases of the urinary organs, as catarrh and suppuration, is a sign of crisis, or of an effort at it. This quality is observed in typhus and putrid fever, in intermittent fevers, in rheumatic, catarrhal, and gastric fevers, inflammatory dropsy, and small-pox. In tuberculous diseases, it is a sign of colliquation. To this also appertains the *urina jumentosa*, which appears in typhus, in rheumatic and arthritic diseases, as also after irregularities in diet, as a whitish turbid urine with similarly coloured sediment.

The varieties in the specific gravity correspond exactly with those in the consistence; these variations may be from 1,005 to 1,052.

Sudden changes in consistence and colour indicate tediousness in chronic diseases, and considerable danger in those of an acute form.

439. The specific odour of the urine is wanting in the case of watery urine and during violent attacks of gout. It becomes acid, when acids are contained in the urine in excessive quantity, the benzoic and lactic acids in children, and the uric acid in adults. This always denotes irregularity in the vegetative process; in children, it is a sign of imperfect digestion, of rickets, and of scrofula; in adults, the acid smell presents itself in lithiasis, both before and after the gouty paroxysms.

The urine has an ammoniacal odour in many cases of putrid fever and typhus, in indigestion, and after injuries of the spinal cord. It acquires a foul smell in consequence of the admixture of putrid mucus, pus, and ichor, in ulceration of the bladder, kidneys, prostate, in chronic catarrhus vesicæ, in cancer of the urinary organs; it is also observed in putrid fever and scurvy, in pernicious intermittents, in scarlatina maligna; in these cases it is a very bad sign.

The urine has a sweetish odour in diabetes mellitus. In some nervous diseases, the urine acquires completely the odour of the food that has been taken. Certain substances, however, such as turpentine, asparagus, &c., modify the odour of the urine even in the normal state.

With respect to varieties of taste, the saccharine taste has attained semeiological value in the case of diabetes mellitus.

The urine acquires an elevated temperature in irritated states of the bladder. We must not, however, depend here on the feelings of the patient, who finds the urine hot in all inflammations and ulcerations of the bladder and urethra. A cold urine, with the exception of that occurring in hysteria, is a sign of depression of the strength.

440. Chemical re-agents deserve a more frequent application to the urine in diseases than they have hitherto had. In the normal state, the urine is acid; when it begins to putrify, alkaline. It sometimes, also, has an alkaline reaction after being voided; this takes place after the use of vegetables and of alkaline substances; it is especially observed in gout and lithiasis. When albuminous flocculi are thrown down on the application of heat or of nitric acid, one may infer that degeneration of the kidneys known by the name of Bright's disease.

If a coagulum form on the application of heat, the urine contains fibrine, arising no doubt from the admixture of blood. If nitric or hydrochloric acid produce a greenish or brown precipitate, the existence of liver disease may be inferred. Urine which by long standing throws down a fine red sediment, contains an excess of uric acid; it denotes abdominal disturbances, arthritis, and lithiasis.

The sugar which remains behind on the evaporation of urine characterizes diabetes mellitus.

441. The quality of the urine on long standing affords important signs. The clouded appearances in urine (*corua urinæ*, *nubecula*) are in fevers a sign of crudity; when they approach the bottom, it is more favourable; in chronic diseases combined with emaciation, this is a sign of colliquation. These clouds in the latter case consist sometimes of fat in the form of drops.

The white sediment consists mostly of mucus and pus; it occurs in suppurations of the urinary organs, in gastric, catarrhal, and rheumatic fevers, in inflammatory dropsy, in intermittent fevers, in what are called obstructions, in hæmorrhoids, in

hypochondriasis, and in consumption. If the sediment sink immediately after voiding the urine, it is pus. There is semen sometimes mixed with the urine; it is longer in sinking than pus. The sediment in long continued gastric disturbances is chalk-like, as also in scrofula, enlargement of the mesenteric glands, and in advanced age; it is sandy (urate of soda and lime) in lithiasis and gout.

A whitish grey sediment possesses critical import in most fevers, more especially in inflammatory, catarrhal, gastric, and intermittent fevers, in typhus, and in bilious fevers. Its critical import may be relied on so much the more if it appear at the time of the crisis, if the clouded appearances have preceded it, and it continue to appear for a considerable time.

The precipitate is of an orange yellow and brown colour in all diseases where the liver or duodenum is affected. The brick red sediment (*sedimentum lateritium*) consists chiefly of uric acid, without doubt in combination with the colouring matter of the urine; it is peculiar to intermittent fevers, catarrhal and rheumatic diseases; in the acute form of these affections it is of critical import; but in the chronic form, and in gout, it is not so. Blue sediments have also been observed. Dark and dark brown sediments are mostly occasioned by the admixture of blood, in *melæna*, melancholy, and in many cases of hæmoptysis. They indicate here long duration and serious disturbance of the portal system. In typhus they are of an unfavourable import. Urinary incrustations have been frequently observed without any disease in men of sedentary habits, who live chiefly on animal food.

The last change which the urine undergoes by long standing is its putridity. If this occur very speedily, it is a sign of ulceration of the bladder or kidneys, of the opening of an abscess into these organs, or of phthisis, putrid fever, and typhus. It presents a very unfavourable prognosis.

442. Among the foreign substances which present themselves in the urine, we may consider particularly pus, mucus, blood, pseudo-membranes, tuberculous masses, and stony concretions.

Pus in the urine may be recognised by its sinking in this fluid, by its smell, and dirty-yellow colour. It comes with and without urine, indicates ulceration of the kidneys, bladder, prostate, urethra, an abscess which empties itself into these organs, or if it only becomes perceptible with the urine it denotes phthisis.

Blood comes partly through a rupture of the bloodvessels,

and partly through exudation into the urine. It may be mixed with it in the kidneys, bladder, at the neck of the bladder, and in the urethra. If it be intimately mixed with the urine, if the urinary secretion itself be changed, and pains are felt in the lumbar region, it proceeds from the kidneys. If, on the contrary, it is coagulated, if griping in the abdomen, great distress, a shivering sensation, spasms, fainting, &c., have preceded it, it comes from the bladder. If it pass off alone, or precedes the urine, without the system participating to any great extent, it comes from the urethra. The causes of bleeding from the urinary organs are irritation of them, as after the use of cantharides, spirit of turpentine, inflammation and ulceration of them, hæmorrhoids, cancer, fungus hæmatodes, polypi of the bladder, stone in the ureters; the cause may also be in the state of the blood, as the case of bloody urine in scurvy, in the morbus maculosus, in typhus, in the confluent small pox, and in putrid fever. Here it is mostly of unfavourable import. It is sometimes vicarious to hæmorrhoids and menstruation. In the case of females, however, it is necessary to distinguish the menstrual blood which falls from the vagina into the chamber-pot.

Mucus, if it pass off without urine, is secreted by the urethra, as in gonorrhœa; if it pass off with the urine, of a viscid, glass-like appearance, or forming turbid clouds, and often of a scaly appearance, it is a sign of catarrhus vesicæ, of irritation of the bladder by stone, as also of imperfect digestion, chronic disturbances of the portal system, and finally of mucous fever and phthisis. Those mucous lumps which come from the vagina are to be distinguished from this.

Pseudo-membranes indicate inflammation of the urinary organs. Prostatic liquor and semen may also be combined in the urine. The escape of gases and of fœces is a sign of a fistulous opening between the intestines and bladder. Tuberculous matter in the urine is a bad sign. Stones and sand are a sign of lithiasis. Worms, also, have been seen in the urine.

VIII.

SIGNS FROM THE DIGESTIVE SYSTEM.

Signs from the Abdominal Integuments.

443. THE changes which may be observed in the abdominal integuments are referrible to the size, form, hardness and softness, and the sound elicited by percussion.

The size of the abdomen is increased by effusion of serum into the abdominal cavity, or into the cellular tissue of the abdominal integuments, by an accumulation of gases, of fat, by general and uniform enlargement of the organs inclosed in the abdominal cavity, or degenerescence of separate organs, more especially of the liver, spleen, uterus, ovaries, and from morbid growths which are developed in the abdomen. These cases may be distinguished from each other by the form, the consistence, and the sound elicited by percussion.

Diminished size of the abdomen is a sign of emptiness of the intestinal canal, and of diminution of the abdominal organs, or of spasm. It arises from the first cause in all states which give occasion to long continued diarrhœa, or which cause a mechanical hindrance to the reception and propulsion of the food, as strictures of the œsophagus, scirrhus of the cardiac orifice or pylorus, degenerescences and morbid growths, which narrow and close up the colon, more especially its extremity. In all these diseases it is a bad sign. A sinking in of the abdomen arises from spasm, chiefly in lead colic and in tetanus. This species is distinguished from the former by the hardness and rigidity of the abdominal muscles. The retraction of the abdomen distinguishes the lead colic from enteritis. It occurs in a minor degree in great ruptures which involve a considerable part of the abdominal organs.

444. The form of the abdomen is very important with respect to diagnosis.

Fulness of the hypochondria, if it occur far upwards, and if the lowermost ribs are bent inwards, indicates a tumour in the thorax, more especially a pleuritic effusion, fungus of the pleura, &c.; if the fulness is confined to the lowermost ribs, so that it increases downwards, the liver or spleen is enlarged.

The sinking in of the epigastric region is a sign of degenerescence of the lesser omentum, of scirrhus of the pylorus and of the surrounding parts.

A fulness under the epigastrium is occasioned by enlargement of the transverse colon, more particularly through fœces. If the navel form the highest point in the fulness, it depends, unless pregnancy or tumours in the abdominal integuments be the cause, on inflammation of the peritoneum, on irritation and inflammation of the small intestines, or on tumefaction of the mesenteric glands. In children, this form is very common, especially in those of a scrofulous habit; an inconsiderable disturbance of the intestinal functions produces it in them, because their pelvis is very small, and the liver is large, so that in children one cannot immediately infer from it mesenteric scrofula. This fulness of the abdomen is an important means of distinguishing diseases of the intestinal canal from those of the brain in children.

If there be prominence of the abdomen in its lower part, one may infer from it pregnancy, relaxation of the abdominal integuments, scrofula, ascites, hypochondriasis, disease of the uterus or ovaries. Lastly, local prominences may form in consequence of tumours in the abdominal integuments and from ruptures.

445. Hardness of the abdomen may be distinguished, according to the feel, into that produced by spasm of the abdominal muscles, and that which depends on the state of the abdominal viscera. It is produced by spasm in lead colic, in tetanus, in hysterical and epileptic spasms, and in the cold stage of fever. It proceeds from the organs inclosed in the cavity of the abdomen in hyperæmia of the abdomen, in irritation and inflammation of the intestinal mucous membrane, in peritonitis, and in worms in the intestines. This hardness is particularly marked in children in slight gastric disturbances.

If the hardness is confined to particular parts of the abdominal surface, it indicates hypertrophy, degenerescence, and infarction of the corresponding organs with their respective secretions. Hardness in the right hypochondrium is a sign of enlargement of the liver; if the surface be knobby, there is reason to suspect morbid growths in this organ. It may also proceed from the right kidney, the colon, or the duodenum. Hardness in the left hypochondrium is a sign of enlargement of the spleen, of the left kidney, and of the colon.

In the epigastrium, it indicates scirrhus of the pylorus and

of the neighbouring parts. If it be felt in the lower half of the epigastrium, it depends on thickening of the transverse colon, and on accumulation of the solid excrements in it. In the umbilical region, partial hardness arises chiefly from hardening and tumefaction of the mesenteric glands, in the hypogastric and inguinal regions from fulness of the bladder, hypertrophy or degenerescence of the uterus and ovaries; in the latter case, also, it may arise from swelling of the lymphatic glands (bubo) and abscesses.

Softness of the abdominal integuments, when hardness of them has previously existed, is a favourable sign; it indicates remission of the diseases of the intestinal canal, or of spasm, and in these precedes the crisis.

White local protrusions, which may be replaced, are ruptures. A sensation as if something crackled beneath the skin, or like that produced by the bending of new leather, is a sign of peritoneal adhesions. In the case of inflammation of the peritoneal covering of the liver, spleen, or of an enlarged ovary, the sensation of friction is perceptible by the ear and hand.

446. Fluctuation is a sign of water in the abdominal cavity; it is in the peritonæum, if the umbilical region sound tympanitically when the patient lies on his back; if this clear sound on percussion, on the contrary, exist posteriorly, there is generally hydrops ovarii. Though in this also the site of the dull part changes with the patient's change of position, still there is never observed the horizontal line in which the dulness on percussion ceases, and passes into the tympanitic, as in the case of ascites.

If the sound on percussion be clear over the entire abdomen, it is a sign that there is gas in the peritoneal cavity, (meteorismus and tympanitis abdominalis;) these states occur in inflammatory affections of the abdomen, when the nervous system begins to suffer, in typhus, putrid fever, and peritonitis; when the strength is sinking, as also in chronic diseases of the abdomen, where the portal system and the peritoneum are in an atonic state, in long continued affections of the liver, spleen, mesentery, diaphragm, and in menstrual congestions. If the sound on percussion is everywhere clear, with the exception of the hypochondria, a considerable quantity of gas is collected in the intestines, (tympanitis and meteorismus intestinalis;) it arises through irritation and inflammation of the intestinal mucous membrane, and occurs in hysterical and hypochondriacal patients, as also in persons labouring under diseases of the heart.

If the sound on percussion over the entire abdomen is dull, one may infer that it is filled with solid or fluid substances.

The extending of the dull sound on percussion in the right hypochondrium superiorly or inferiorly indicates hypertrophy, degenerescence, and morbid growths of the liver. If it reach from the right hypochondrium only towards the left, these changes are limited to the left lobe of the liver. If a peculiar tremor is perceptible on percussion, there are hydatids in the liver.

A distended gall-bladder produces a slight dulness on percussion on the anterior point of the tenth rib, and for the most part a humoral sound. If the sound of percussion is clear in the normal hepatic region, it is a sign of atrophy of the liver.

A dull sound in the left hypochondrium indicates the situation of the spleen; if it extend further forwards or upwards, there is hypertrophy and degenerescence, or there are morbid growths developed in it. In enlargement of the liver and spleen, percussion has a decided advantage over palpation.

A dull sound in the gastric region, when the stomach is not full, evinces changes of its structure, or of the neighbouring organs, which have already proceeded a considerable way. A very clear sound in the gastric and umbilical region denotes the collection of a considerable quantity of gas in the stomach and small intestines. Dulness of sound on percussion in the umbilical region is caused by an accumulation of fœces in the small intestines, and by enlargement of the mesenteric glands; if it extend to the hypogastric and inguinal regions, it depends generally on distention of the bladder, or diseased states of the uterus and ovaries. Dull sound on percussion in the right iliac region indicates fulness and degenerescence of the cœcum. The intestines, when they contain at the same time fluid and gaseous substances, yield the hydropneumatic sound; this occurs also in the case of slight exudations into the sac of the peritoneum; but then it changes its place with the change in the position of the body, which is not the case in that depending on the intestines.

But dulness of sound on percussion proceeds not only from enlarged organs, but also from tumours, which are developed in the abdominal parietes, or in the cellular tissue of the abdominal cavity. That it proceeds from the organs will be discovered in this way,—namely, by the dull sound forming a uniform continuity with the place, where it is found to be natural; or, if it be clear in the normal state, by the entire

contour of the organ corresponding to the place yielding a dull sound. If the sound on percussion be clear on the edges of an abdominal tumour, this tumour is seated in the abdominal integuments. If such a tumour in the abdominal parietes be pressed forcibly inwards when percussion is performed, it loses this dull sound, whilst in tumours within the abdominal cavity it increases in this case.

In judging of these phenomena it should be recollected that many organs of the abdomen may change their situation, and accordingly, for the attainment of correct results, these phenomena should be compared with those obtained by palpation, and those presented by disturbance of function.

Signs from Abdominal Pains.

447. Abdominal pain, unless it arises from skin diseases and rheumatism of the abdominal muscles, is a sign of irritation or inflammation of the abdominal organs, of their distention with gas, or it proceeds merely from the nervous system. In the latter case, it is diminished by pressure, in the former, increased. Thus the inflammatory abdominal pain, according to the place where it appears, indicates irritation or inflammation of the corresponding organs; the pain in the loins sometimes appears to arise sympathetically; it precedes menstruation and the hæmorrhoidal flux; it furthermore indicates chronic inflammation of the spinal cord, degenerescence of the same part, inflammation of the bladder, rectum, and uterus.

448. The kind of pain is just as important as its seat. The superficial pungent pain is a sign of peritonitis; the dull, heavy pain denotes inflammation of the liver, spleen, and intestinal mucous membrane. The pain is of a burning kind in irritation, in chronic inflammation, and degenerescence of the organs of the abdomen, more especially of the mucous membrane of the intestinal canal. It is of an itching kind in helminthiasis, in chronic intestinal inflammation, in hysteria, and hypochondriasis. It is particularly necessary to distinguish from this the pain occasioned by eruptions on the skin of the abdomen. Tensive pain manifests itself chiefly in the hypochondria, in disturbances of the portal system, in case of disease of the liver and spleen, in hypochondriasis, in what are called infarctions, and in chronic peritonitis. If the pain appear periodically with great intensity, and at intervals perfectly free in the umbilical region, neuralgia cœliaca is present. In colic,

the paroxysms of pain are accompanied with flatulence, without a change in the pulse corresponding to the pain, and they abate on pressure. Lacerating pains which change their seat are to be ascribed to rheumatism of the abdominal muscles, more especially if they are increased by the motions of the trunk. If slight pressure, or mere contact, produce pain, peritonitis or inflammation of the abdominal integuments is present. According as the pain decreases by lying on the back or abdomen, we may infer inflammation of the anterior or posterior part of the peritoneum. In peritonitis, pressure directly backwards sometimes does not give pain, while the contrary occurs by pressing the abdomen obliquely. If the pain increases on the sides when pressure is made from the hypochondrium, the mesentery is inflamed.

Signs from the Teeth.

449. Carious teeth indicate long continued irregularities of digestion; they are found particularly frequent in scrofula and rickets.

The teeth appear to be elongated in scurvy, phtthisis, and scrofula; this arises from retraction of the gum. In scurvy, and in consequence of the action of mercury, their firmness suffers. They become very sensible in many nervous diseases, and in consequence of the presence of acid in the stomach.

450. The teeth sometimes become covered with a whitish or grey mucus; this occurs chiefly in catarrhs and inflammations of the digestive and respiratory organs. In the typhous forms of fever, the coating becomes brown and dark, which always denotes present danger.

The deposition of tartar should take place, according to some, before regular paroxysms of podagra.

451. Grinding of the teeth occurs in children and irritable persons during sleep, without any disease. If it occur in children who never evinced any such symptom before, if it occur with starting from sleep, if it be accompanied by great brightness of the eyes and flushing of the cheeks, there is reason to apprehend convulsions; it occurs in worms in the intestinal canal, and in cerebral affections. In old persons, when it is observed in sleep it often precedes apoplexy. In typhus and small pox it is of unfavourable import; in hysteria, where it also happens in like manner, it does not render the prognosis bad.

Chattering of the teeth accompanies the cold stage in acute diseases, chiefly in intermittent fever. From its severity, we may infer that of the paroxysm. It also occurs in hysteria.

Signs from the Gums.

452. The gum is pale in chlorosis and anæmia, of a purple red colour before an active hæmorrhoidal discharge, and in case of dysmenorrhœa, of a dark-red colour, spongy, and bleeding readily in scurvy, diabetes mellitus, and after the use of mercury. Spongy growths indicate caries of the subjacent bone.

The gum exhibits the same coating as the teeth, with the same diagnostic and prognostic value.

The Signs of Disease from the Tongue.

453. The pathological phenomena on the tongue are in a great measure sympathetic. They are connected chiefly with diseases of the intestinal canal and lungs, a thing which may be most naturally explained by the continuation of the lingual mucous membrane in both organs. Before one can infer a sign of disease from an appearance of the tongue, we should inform ourselves of the ordinary state of the tongue, and of the accidental causes which are capable of producing such changes. There are many persons whose tongue in the normal state, for instance, is covered with a white coating, especially in the morning, and towards the root of the tongue. Persons who sleep with the mouth open generally have a dry brown tongue in the morning. The tongue may also be variously coloured by medicines and food.

The signs from the tongue may be divided into objective and subjective. To the former belong the changes of size, form, consistence, humidity, colour, temperature, secretion, and motion of the tongue; to the subjective, the anomalous sensations of taste.

454. Enlargement of the tongue may be occasioned by hypertrophy, inflammation, or congestion. Inflammatory swelling of the tongue, if it occur in other acute diseases, as angina, pulmonary inflammation, measles, plague, or variola, yields an unfavourable prognosis. Even noninflammatory swelling of the tongue is a dangerous phenomenon, in acute diseases, especially in cerebral diseases, which are combined with coma. If it be the consequence of mercury, of the abuse of spirituous

drinks, of gastric inflammations, of chlorosis, of syphilis, or if it occur in hysteria and epilepsy, the prognosis is not dangerous; but the disease is always more tedious where the tongue swells, than where it does not. It is enlarged also by degenerescence and cancer.

455. Diminution of the size of the tongue takes place where there is considerable emaciation. In this case, it continues soft and moveable. If in acute states the tongue becomes small and is at the same time hard, retracted, and pointed, the irritation is very great and the prognosis bad. This sign occurs more especially in typhus, in the oriental cholera, in inflammation of the lungs, and in acute cerebral affections. In hysteria and epilepsy this phenomenon has no unfavourable import.

456. The form of the tongue seldom changes in consequence of internal diseases. The slightest change is enlargement of the papillæ in chronic irritations of the stomach, in chronic dyspepsia, and in the acute exanthems. If the dyspepsia has lasted a long time, the tongue may be chopped at the edge. It becomes elongated through paralysis and in epilepsy.

A soft tongue, which is at the same time moist, affords a favourable prognosis in acute diseases, whilst a flaccid tongue indicates great debility. For the hard tongue *see* 455.

457. A moist tongue is a good sign. Dryness of this organ occurs in violent inflammations and irritations, more especially in those of the intestinal canal and of the respiratory organs, as in diarrhœa, typhus, pneumonia, gangrene of the lung, pleuritis, peritonitis, enteritis, catarrhus gastricus, gastritis, inflammation of joints, &c. The higher degrees of dryness are, the rough, the fissured, and lastly the burnt tongue. They yield a still more unfavourable prognosis than the simple dry tongue. If these signs are not accompanied by thirst, very little hope remains. If a dry tongue becomes moist, the disease abates, and a crisis may be expected.

458. The colour of the entire tongue (considered apart from its coating) may become paler or redder, even to a violet colour, or a brown and dark red.

The normal colour of the tongue is always a favourable sign, more especially if it occur towards the time of the crisis. If it be observed at the commencement of internal inflammations, it has not this import.

The paleness of the tongue varies from the rose-red to the

reddish white and pale lily, when the tongue becomes as it were transparent.

A pale tongue is observed in serous conditions of the blood, in chlorosis, after great loss of blood, in chronic diseases, as also in great sinking of the strength in acute diseases, which assume a nervous form, as typhus and scarlatina maligna. It is also found in enteritis and dysentery, when but little fever is present. Here it is the drawing of the juices downwards which produces the paleness of the tongue.

A very red tongue indicates a violent inflammation, mostly of the intestinal canal, but also of the lungs and of the pharynx, and the acute exanthems. If a coated tongue, in acute diseases of the intestinal canal, becomes clean and very red, without at the same time some return of strength to the patient, the prognosis is very unfavourable. But if the debility is not considerable, and the tongue becomes clean and very red, whilst other febrile symptoms continue, a new inflammation may be expected.

Sometimes this redness assumes a varnished and varying character, as occurs in scurvy and putrid fever. It assumes a yellow appearance in many cases of intermittent fever, putrid fever, and pulmonary inflammation, in which the liver sympathizes.

The tongue becomes a blackish red and bluish red in all serious disturbances of the circulation and respiration, as also in severe diseases of the lungs and heart, as catarrhus suffocativus, asthma, extensive inflammation of the lungs, in the morbus cæruleus, carditis, Asiatic cholera, plague, confluent small-pox, and putrid fevers. It becomes black and livid in case of vitiation of the blood, more especially in scurvy, at the setting in of gangrene, and in phthisis, when death is nigh at hand.

459. Increased temperature of the tongue, besides occurring in glossitis, is also observed occasionally in violent internal inflammations, in typhus, &c.

A cold tongue is frequently observed towards the approach of death: it is a characteristic sign for Asiatic cholera.

460. The secretion of the lingual mucous membrane becomes abnormal in many diseases, that is, the tongue becomes coated.

A clean tongue is of favourable import, if it be at the same time moist, and other signs of crisis are present. But if, together with being clean, it be at the same time dry and red, as happens in the febris nervosa lenta, the acute exanthems, and plague, the prognosis is bad. This holds good for all diseases which are determined by mucous secretion of the intestinal canal; if in these the

tongue continue clean before the time of the crisis, we may infer that the disease will be tedious, or, in consequence of the deficiency of juices, that its termination will be unfavourable.

461. The tongue is found coated chiefly in diseases of the intestinal canal, of the lungs, of the skin, and in rheumatic affections. The coating of the tongue varies in colour, thickness, adherence, extent, and lastly, peculiar forms of the secretion of the mucous membrane may occur.

462. The light whitish coating which covers the upper surface of the tongue, with the exception of the apex and edges, is the most frequent. If the summits of the papillæ remain uncovered, it is called the bilious tongue. The white light coating occurs in the less violent inflammations, and in catarrhs of the intestinal canal, of the respiratory organs, and in rheumatism. It is sometimes also observed in other inflammations, without there being any gastric complication. It is a favourable sign unless a commencing violent inflammation, with a hard quick pulse and a dry skin, correspond to it; but if the skin is at the same time moist, if the pulse is soft, less frequent, if the urine present a cloudiness, it is to be considered as a favourable sign.

The thicker fat-like coating always occurs in connexion with great debility; it is observed among the acute diseases, more especially in plague, typhus, putrid bilious fever, typhoid diarrhœa, malignant scarlatina and variola, and in adynamic internal inflammations, amongst chronic affections, chiefly in gout, in chronic affections of the stomach, and in inveterate syphilis. In acute diseases, this thick coating is a dangerous sign, and in those of a chronic form it announces their long duration.

463. The firm attachment of a coating of the tongue to this organ shews that the disease is not yet on the decline; if a coating previously firm becomes loose, without another of the same consistence immediately forming beneath, we may hope for a speedy termination of the disease.

464. The colour of the coating is most frequently white, especially before the crisis sets in; when this commences it is mostly yellowish and loose. The continuance of the white coating indicates a tedious disease.

A yellow or greenish coating immediately at the commencement of the disease indicates an abnormal bilious secretion. It is found as well in diseases of the digestive organs, as in jaundice for instance, in hepatitis, in enteritis, in diarrhœa and gastric catarrhs, as it is in diseases of other organs, where this yellow

coating warrants us in inferring a simultaneous intestinal affection, more especially in chlorosis, pleuritis, and pneumonia.

The brown coating of the tongue presents itself under three conditions,—namely, (1) in long continued disturbances of the intestinal canal, as in arthritis, in hæmorrhoids, and in chronic jaundice; (2) in diseases where the constitution of the blood is changed, as in scurvy, putrid fever, typhus and nervous fevers; (3) in consequence of the white coating being dried during the existence of great heat in violent fevers, or during sleep with the mouth open.

The brown coating of the tongue yields a suspicious prognosis in the two first-mentioned cases.

The black colour of the coating of the tongue is only a higher degree of the brown. It arises in diseases with great heat and a vitiated state of the blood, in typhus, in putrid fever, in diarrhœa and small-pox when they become typhous, in many cases of metritis, hepatitis, enteritis, and of pneumonia, and in gangrene of the lung. Unless other more favourable signs are present with this black coating, the prognosis becomes very unfavourable.

If it occur in chronic affections of the intestinal canal, in diseases of the liver, in chronic inflammation of the intestines, the prognosis is in like manner very bad. A grey, condensed, thick coat, more especially towards the root, where it appears with a bitterish taste on the mouth, is a dangerous sign of liver disease.

465. The coating may be diffused over the entire tongue, or be merely partial.

A general coating, as well as one confined to the root of the tongue, ordinarily indicates a regular course of disease, and accordingly yields a favourable prognosis. The partial coating of the tongue is either lateral and strictly confined to one side, or it is limited to the apex of the tongue, or there is a streak of coating in the middle of the tongue. Every partial coating indicates a tedious course and imperfect crisis. If the coating of the tongue loosens from the edges towards the middle, a speedy termination of the disease is to be hoped for. If the middle becomes first clean, the disease will still be somewhat protracted.

466. False membranes, and pustules occur as peculiar forms of the secretion of the mucous membrane.

False membranes are either small white points, or large portions; they may even envelope the entire tongue. They are sometimes white, sometimes yellow, and sometimes reddish.

The greater the false membrane is, the worse is the prognosis. In many cases, inflammation of the intestinal canal is connected with it.

Pustules on the tongue (aphthæ) are sometimes idiopathic, but in most cases symptomatic. They are either discrete or confluent; the confluent are the worse. Those which are hardish and dry, and also those which are blue, and those of a blackish appearance, which sometimes occur in acute diseases, are of an unfavourable import. The whitish, soft, moist, half transparent pustules, on the contrary, are of a more favourable import. If the eruption of the aphthæ is repeated, a longer duration of disease is to be apprehended. They accompany a number of diseases of the intestinal canal and of the lungs, especially the chronic forms; they are found in gastric catarrhs, in enteritis, metritis, dysentery, peritonitis, in intermittent fevers, typhus, also in pleuritis, pneumonia, and in the third stage of pulmonary phthisis.

If they appear with critical discharges after the seventh day, they yield a favourable prognosis. If they do not come under these circumstances, but with sinking of the strength, they are to be considered as unfavourable. In pulmonary phthisis they are a precursor of death. When combined with scorbutic phenomena they are bad.

An anomalous course of the aphthæ is the sign of a new complication, or of the recrudescence of the disease.

467. Psoriasis of the tongue is combined either with psoriasis of the skin, or occurs without this where it is connected for the most part with syphilis or with dyspeptic states. The tongue is in these cases at the same time swollen and traversed with several fissures. Ulcers of the tongue occur in scurvy, arthritis, mercurialism, and syphilis, or they are occasioned by cancer. They appear but seldom in consequence of acute diseases, more especially of the intestinal canal, where they are a bad sign.

468. If the motions of the tongue are certain and easy, it indicates a continuance of strength. A tremulous tongue in all acute nervous states is of unfavourable import. If it occur in chronic nervous diseases, as hysteria, hypochondriasis, St. Vitus' dance, it is no dangerous sign. It is sometimes a consequence of violent exertions, and occurs in chronic diseases attended with great debility. If the patient leave the tongue out after he has shewn it, the prognosis is bad; the brain appears in this case to be seriously affected; as also if he stretch it out after long thinking. Trembling of the tongue and difficulty of moving it precede apoplexy.

If apoplexy has set in, the tongue is drawn over towards the healthy side.

469. The various states of the mucous membrane of the tongue are parallel to those of the general integuments, in case both are occasioned by an affection of a third organ. In particular, the changes of its size, consistence, colour, temperature, and the degree of moisture, correspond with similar changes of the skin. The changes of the coating of the tongue coincide with analogous changes of the perspiration. This similarity and simultaneity of the changes is seen more manifest in acute than in chronic diseases.

The motions of the tongue are an accurate measure of strength; they correspond with the strength of the other muscles of the body.

It has been said of the coats of the tongue that they are always connected with a similar state of the stomach and small intestine. Though this is often the case, it cannot, however, be always proved to be so.

Signs from the Saliva.

470. Increased secretion of saliva (ptyalismus) takes place (1) when a state of irritation is present in the proximity of the parotid gland, or in the cavity of the mouth, as in dentition, in aphthæ, ulcers of the gums, in glossitis, amygdalitis, scurvy, face-ache, diseases of the jaw-bone, of the œsophagus, in consequence of irritation of the mucous membrane by acrid medicines; confluent small-pox may also occasion this phenomenon; (2) salivation may be occasioned by diseases of the stomach, liver, and pancreas. The sympathetic affection of the stomach in pregnancy is sometimes accompanied by salivation, which in this case mostly takes place after conception, and sometimes continues to the time of delivery. It is also observed to occur in weakened digestion, in gastric catarrhs, after the use of emetics, in mania, in what are called abdominal obstructions, in hypochondriasis and hysteria; (3) salivation occurs during the use of mercury or antimony.

In confluent small-pox, salivation is a favourable sign. If it cease before the ninth day the prognosis is bad. In lingering intermittents, salivation is sometimes critical; more frequently in these affections it precedes the termination in dropsy.

Diminution of the salivary secretion, and, in consequence of this, dryness of the mouth, is peculiar to the commencement of

acute diseases, as also to the hectic fevers occasioned by affections of the abdominal organs. If the flow of saliva stop suddenly, there is reason to apprehend an affection of the brain.

471. Thick viscid saliva occurs under the same circumstances as the diminution of the salivary secretion, especially in small-pox, typhus, and in hectic fevers. It is thin in ptyalism. In gastric diseases where the liver participates, it becomes yellow or green; by the admixture of blood it may assume a reddish colour; in pregnant or lying-in women it is sometimes milky; an icy cold saliva was observed by the author in face-ache.

Frothy saliva from the mouth is observed in apoplexy, epilepsy, hydrophobia, and in the hysterical paroxysm.

Signs from the Throat.

472. Enlargement of the amygdalæ and uvula occur in consequence of inflammation and hypertrophy. They often occasion dyspnœa and cough, and an elongated uvula may even produce most of the signs of phthisis.

473. Redness of the throat is a sign of inflammation, both idiopathic and sympathetic, as in typhus, scarlatina, measles, syphilis, and in long continued affections of the intestinal canal or organs of respiration.

Dilated vessels are a sign of chronic inflammation. The longer the redness has lasted, the more difficult is the radical cure, and the more probable are relapses.

474. Dryness of the mucous membrane of the throat is usual at the commencement of irritation and inflammation of this part; if it have continued a long time, the disease becomes tedious. The same may be said if this mucous membrane remain a long time covered with mucus.

Psoriasis in the throat indicates long continued inflammation. Pseudo-membranes in the throat are a sign of diphtheritis, and yield a suspicious prognosis if the patient exhibits prostration of strength from the commencement, if the pseudo-membranes are dark or black coloured, or if they extend to the trachea and larynx. Aphthæ in the throat are either idiopathic or they are a symptomatic phenomenon, as in typhus, small-pox, and in pulmonary tubercles. The symptomatic are a bad sign. The idiopathic are not attended with danger. If the throat appear as it were strewed over with aphthæ, and they extend from thence toward the anterior parts, great danger exists.

Ulcers of the throat arise either from aphthæ or from inflam-

mation not aphthous, after chancre, gonorrhœa, excessive use of mercury, &c.

Abscesses in the throat are dangerous only on account of the possibility of their producing suffocation by pressure, or by the effusion of pus into the larynx. In many cases there exists a great disposition to relapse.

Pain in the throat accompanies angina, inflammation of the larynx, &c.; it sometimes precedes croup; moreover, a pain is observed in that part which is of purely nervous origin, and which is of a squeezing, tensive character in epilepsy, hysteria, hypochondriasis, and helminthiasis.

Signs from Swallowing.

475. Swallowing becomes morbidly changed (1) from disease of the organs of deglutition and the surrounding parts. Among the causes of this symptom may be enumerated inflammation of the pharynx, œsophagus, amygdalæ, tongue, parotid, aphthæ in the pharynx, ulcerations in these parts and the epiglottis, swelling of the tonsils and uvula, polypi of the pharynx and œsophagus, induration and softening of the œsophagus, pressure from without on the pharynx or œsophagus, foreign bodies in this tube, and, lastly, scirrhus of the cardia; (2) morbid changes of swallowing proceed from the brain, as in apoplexy, hysteria, hypochondriasis, hydrophobia, tetanus, typhus, in nervous fevers, in cerebral pressure and cerebral inflammation. The form under which it occurs in these cases is paralysis or spasm.

476. Swallowing may become more rapid; it may become difficult and even impossible, and at the same time painful; the effort and motion thereto may be made without there being anything present to be swallowed; the morsel may take a false direction; and lastly, swallowing may be combined with noise.

Swallowing takes place more rapidly than natural in spasmodic affections, without this, however, having any influence on the prognosis.

477. Difficulty and impossibility of swallowing may be referred to the above mentioned morbid states as their causes.

If it be at the same time painful, inflammation, ulceration, or aphthæ are present. The part where the pain or difficulty exists indicates the seat of the disease. If mere (empty) swallowing is painful, the disease is at the top of the throat. If there are spasms in other parts, and the sensation of a ball in the neck, with the difficulty of swallowing, hysteria or hypochondriasis

must be the cause. If other parts be paralyzed, if there be a rumbling combined with the swallowing, paralysis may be inferred to exist. If in case of difficulty of swallowing there be after some time a regurgitation of food which had been to all appearance swallowed, scirrhus of the cardia or stricture of the œsophagus are the cause. If cough and dyspnœa are observed along with the difficulty of swallowing, either chronic laryngitis is present, or a tumour, such as aneurysm, presses on the trachea organs of deglutition.

With respect to prognosis, the following principle holds good : the longer the difficulty of swallowing continues, so much the worse ; in the same manner, if it increases slowly it yields a worse prognosis than if it has set in rapidly. Aphagia which does not depend on inflammation is fatal. If dysphagia depend on paralysis or organic diseases, the prognosis is unfavourable.

Dysphagia in cases of simple angina, in aphthæ, in glossitis, in swelling of the parotid, in hysteria and hypochondriasis, has nothing in it suspicious.

Dysphagia at the commencement of acute diseases is not dangerous ; towards their termination, however, it is very much so, more especially in the acute exantheams. Dysphagia after swallowing corrosive substances is dangerous. If it be occasioned by diphtheritis or inflammation of the œsophagus, it is suspicious.

In all diseases of the brain it is a bad sign.

If the dysphagia exist merely for fluids, and if spasms of the throat commence at the mere sight of them, the prognosis is very bad, as hydrophobia is in such case present.

478. Empty swallowing is produced by elongation of the uvula.

The opposite to this is the case where the patient forgets to swallow down food which he has taken into his mouth, as occurs in sopor and delirium.

In the wrong direction of the bolus, two cases are possible,—it either goes into the nose, when the velum palati or hard palate is cleft, or into the air-passages, and (1) into the larynx, as in paralysis of the pharynx in consequence of apoplexy, in ulceration of the epiglottis and glottis, or through a fistulous opening between the pharynx and larynx ; in these cases, cough comes on immediately after swallowing, (in case of mere inflammation of the larynx the cough is excited by swallowing, but without dysphagia being at the same time present) ; (2) into the trachea

through a fistulous communication between this and the œsophagus. Some cough then comes after swallowing.

479. A rumbling noise during the swallowing of fluids is a bad sign in acute diseases which have passed into the nervous form; it arises in these cases from paralysis of the organs of deglutition. Besides, this phenomenon is frequently found in convalescent and hypochondriacal patients, where it exercises no influence on the prognosis.

Signs from the Appetite for Drink.

480. This may be increased or diminished, or may be directed to particular, usual, or unusual drinks. These changes do not belong exclusively to diseases of the intestinal canal, but they commonly depend on the state of the entire vascular system, and of the secreting organs.

481. Increased appetite for drink, or thirst, occurs in two kinds of states:—First, it accompanies most cases of irritation and inflammation, as soon as these act on the entire vascular system; so far it is a diagnostic means for detecting latent inflammations. Thirst in phthisis makes the co-existence of an inflammation probable; in dropsy, it indicates an inflammatory origin of the disease. If thirst attend chronic diseases, an inflammatory complication may be inferred with considerable probability. Thirst is very seldom absent in diseases of the intestinal canal.

In the first and second stages of acute diseases there is nothing bad to be inferred from the existence of thirst; but if it continue after critical evacuations have taken place, with other signs of irritation, the prognosis is suspicious, as also if the thirst continue with equal intensity in the remittent stages of fever.

Thirst, combined with an inability to drink water, constitutes a peculiar form; this is more especially the case in hydrophobia; sometimes, however, it occurs also in mental diseases, in hysteria and hypochondriasis.

A second order of conditions in which thirst presents itself are, copious serous evacuations; accordingly, salted articles of food occasion violent thirst; this occurs still more in profuse perspiration; it takes place in its most intense form, however, in diabetes and Asiatic cholera.

482. Want of appetite either really exists or is only apparent. The apparent form is observed in the delirium of nervous

fever, in cases where the tongue and lips are dry. If the patient be asked whether he is willing to drink, he answers in the affirmative, in case he comes to himself. It is always a suspicious sign.

The real absence of an appetite for drink is a good sign in acute diseases, if it follow thirst among critical phenomena. But if the thirst ceases without a remission occurring in the disease, the prognosis is bad.

In chronic diseases, the absence of a desire of drink is among the ordinary phenomena.

483. The desire of drink may be directed to certain drinks; these may be the ordinary drinks, or those not generally used, or even unfit for use.

The patient prefers cold water and ice in inflammations of the intestinal canal, in gastritis, enteritis, as well as in diarrhœa and cholera.

In other acute diseases, this longing after cold water is commonly not present. If the desire of wine returns back of itself in convalescence from typhoid diseases, the prognosis is good.

A desire of vinegar is peculiar to chlorosis, and of valerian drinks to hysteria.

Signs from the Appetite for Eating.

484. The continuance of the normal appetite in chronic diseases is a good sign. The appetite may be simply increased or diminished, it may be directed to things unfit for eating, or be augmented or diminished for certain articles of food.

485. Increased appetite, hunger, (in its extreme degree, fames canina, bulimia,) is occasioned either by an increased want of nutrition, or a state of irritation of the stomach, or by disease of the nervous system.

Hunger occasioned by increased necessity takes place in pregnant women, after long continued want of food, and during convalescence from chronic and acute diseases. If the appetite return again after anorexia in a disease, in connexion with other signs of improvement, recovery is nigh at hand. Increased appetite at the commencement of acute diseases is unfavourable, as being a disproportionate sign. If the strength does not return in convalescence when there exists a good appetite, either the patient eats too much, or it is a sign of phthisis having set in.

If in acute diseases the appetite is directed to particular articles of food, it becomes necessary to consider whether this craving

is proportioned to the stage of the disease, the quality of the food, and the idiosyncrasy of the patient, and whether this craving continues, and to observe whether indulging this craving is accompanied by a favourable influence on the disease, in order to know whether a favourable prognosis is to be drawn from it. Such an appetite is frequently a matter of imagination, produced by mere reminiscences, by the descriptions of others, or by ennui. It corresponds not in these cases with the real wants of the patient.

486. Increase of appetite in consequence of a state of irritation of the stomach takes place after the ingestion of irritating substances, (coffee, alcohol, pepper, &c.) In morbid excitement of the stomach, more especially in worms in the intestinal canal, in organic diseases of the intestinal canal, in quartan fevers, and towards the end of pulmonary phthisis, the appetite is somewhat augmented. If a great appetite set in suddenly in chronic or acute diseases, without critical signs having preceded, this depends generally on irritation of the stomach, and is accordingly of unfavourable import. Hunger at the commencement of acute gastric irritation is not of bad import, it commonly gives way to anorexia.

487. Diseases of the nervous system, as hysteria, hypochondriasis and mania, constitute the third source of increased appetite. In these diseases more especially, the higher degrees of hunger manifest themselves, as bulimia, and fames canina. If such patients do not satisfy their hunger they faint away. The quantities of food swallowed by such patients are very large. They commonly vomit back part of it.

488. The morbid diminution of appetite, which sometimes amounts to perfect loss of appetite, (anorexia,) may depend on the little necessity there exists for food, on idiopathic and symptomatic affections of the intestinal canal, or on diminished sensibility of the stomach. The necessity for nutrition is but little in aged persons, in weakly men, where there is no bodily movement, and in sedentary habits of life. The morbid diminution of appetite appertains to most acute diseases, be their seat where it may. It is found most constantly in diseases of the stomach, in its irritation or inflammation, in cancer, and in nervous affections of the stomach, and less constantly in diseases of the lower parts of the intestinal canal. In chronic diseases, unless the stomach is also affected, the appetite does not absent itself for any length of time. If this is the case, there is great debility present, and the prognosis is unfavourable. At the commence-

ment of acute diseases, loss of appetite is an ordinary occurrence ; it is a provision of nature ; if it likewise continue at the end of the disease, the prognosis is suspicious. If it occur during convalescence, a relapse is indicated.

If augmented appetite become changed by eating a few morsels, into loss of appetite, irritation, chronic inflammation or cardialgia is the cause.

Diminished appetite from morbid sensibility of the stomach is observed after taking opium, alcohol, but still more in mania and in magnetic states.

489. The direction of the appetite towards things not fit for eating has been remarked in hysteria, chlorosis, in amenorrhœa, mental diseases, and in pregnancy ; it does not render the prognosis unfavourable ; sometimes it occurs in acute diseases in connexion with delirium ; then the prognosis is bad. Pica is distinguished as a longing after food not fit to be eaten, and malacia a longing after tainted food.

490. Increase of appetite for particular kinds of eatable food proceeds sometimes from the necessity felt by the organism, and sometimes from perversion of the nervous system. In chlorosis there is a longing after things of difficult digestion, as for instance after brown bread crusts ; in scurvy, after fresh acid vegetables ; in gastric irregularity, after acid food. If a longing after animal food sets in at the height of a nervous fever, this indicates considerable perversion of the sensibility, and so far it is a bad sign. If a desire for animal food return during convalescence, it is of good import. The craving for strong stimulants is mostly, though not always, occasioned by weakness of digestion. Increase of appetite for particular kinds of food, if the nervous system is diseased, yields important therapeutic hints, though it possesses but little value with respect to prognosis and diagnosis.

491. A dislike to certain kinds of food, unless it depends on idiosyncrasy, is most to be attributed to the state of the stomach and small intestines. A dislike to flesh meat is found most frequently in gastric catarrh and hepatic disease.

Signs from the Loathing of Food.

492. By loathing (ekel) is understood an aversion to food. It may be directed against all and every kind of food, or merely against some particular kinds. It seems to proceed from an affection of the nerves of the stomach, which may arise either from

the nervous system or from the mucous membrane of the stomach. Loathing is sometimes combined with sickness and shivering, and sometimes passes into vomiting.

493. In sea-sickness, and where it takes place during rapid travelling by land, as happens to many persons, it proceeds from the nervous system; it is here mostly connected with vertigo. The loathing at the commencement of pregnancy, and that which is produced by operations on the eye, comes under this head, as also, according to Magendie's experiments, the loathing produced by emetics. The idea or sight of a disgusting object is capable of producing loathing. In hysterical and hypochondriacal patients, loathing proceeds mostly from the nervous system. Loathing is sometimes the first sign of the action of contagion which is followed by acute diseases. With the exception of this latter case, this kind of loathing has no bad import.

494. Loathing proceeding from the mucous membrane of the stomach is a usual phenomenon in the first stage of most acute diseases, and here affords no unfavourable prognosis. It is the usual accompaniment of irritations and inflammations of the intestinal mucous membrane, of the pancreas, spleen, mesenteric glands, and liver. It occurs, for instance, in the case of worms in the intestinal canal, in gastric catarrhs, in ulcerations and indurations of the above-mentioned organs, in strangulated herniæ, &c. It sometimes occurs in consequence of intense hunger.

Long continued loathing in chronic diseases yields a bad prognosis; it gives occasion to apprehend organic changes in the digestive organs.

If loathing continues in the later periods of acute diseases, with signs of debility, as in nervous fevers which run a long course, the prognosis is bad; in every case, the disease is then tedious. Loathing in convalescence precedes a relapse.

Signs from Nausca.

495. Nausea commonly precedes vomiting. Like loathing, nausea has two sources; it either proceeds from the nervous system, or from the intestinal mucous membrane.

Nausea in hysteria and hypochondriasis, in pregnancy, and probably, also, that which occurs sometimes during parturition, has its origin in the nervous system. Nausea before and after epileptic fits, that which occurs at the sight or recollection of a

disgusting object, in sea-sickness, in case of injuries of the head, also proceeds from the nervous system. This kind of nausea does not influence the prognosis.

From disease of the gastric and intestinal mucous membrane, nausea arises in irritation and inflammation of this membrane, in peritonitis, nephritis, metritis, and in typhus. In these cases, nausea does not make the prognosis bad, except when it lasts for a long time, in nervous fevers, and when it does not cease after vomiting.

Signs from Heart-burning.

496. Pyrosis is a burning, squeezing sensation, extending from the stomach, through the œsophagus into the pharynx. It occurs (1) in irritation and inflammation of the stomach, after the ingestion of food, difficulty of digestion, in softening or induration of the gastric mucous membrane, in scirrhus of the stomach, in disorganization of the liver and mesentery; (2) in hysteria, pregnancy, raphania, and in morbidly increased sensibility of the stomach.

If it continue long, there is some reason to apprehend organic changes of the stomach, especially scirrhus.

Signs from Eructation, (Aufstossen.)

497. The eructation of fluids from the stomach is connected with more or less violent, sometimes even imperceptible, strainings of the œsophagus. It is commonly connected with heart-burning, and occurs in all diseases which give rise to this. It has also been observed in induration of the pancreas. It is necessary to distinguish from this the confluence of fluids in the mouth, caused by increased salivary secretion.

The regurgitated fluid may have a salty, sour, or sweetish taste, or it may be tasteless.

Salty eructation takes place in hysteria, in diseases of the uterus, and in hæmatemesis. The sour eructation is connected with indigestion, softening, irritation, inflammation of the gastric mucous membrane, cancer of the stomach and pancreas. The sweetish eructation frequently precedes hæmatemesis. That which is tasteless occurs in diseases of the stomach and neighbouring organs.

Long continued eructation, particularly if sour, gives reason to dread organic changes of the stomach.

Signs from Straining.

498. Straining (vomituritio) either precedes vomiting, and accordingly presents itself under the same circumstances as this, (*see* 499, *et seq.*), or no vomiting follows, in which case it is a proof of the impossibility of removing the irritant; it is accordingly found in ulcers and in cancer of the stomach, in poisoning by arsenic, and in hysteria. If a disease of the stomach itself, and not hysteria, is the cause of a long continued straining, the prognosis is bad.

SIGNS FROM VOMITING.

1. *The Act of Vomiting.*

499. Loathing, sickness, pain of forehead, vertigo, &c., commonly precede it. According to its causes it may be brought under two principal divisions; namely, under the first comes vomiting on the part of the intestinal mucous membrane, as takes place in irritation, inflammation, softening, nervous disturbance, and cancer of the stomach; accordingly, in strangulated hernia, hypochondriasis, typhus, yellow fever, Asiatic cholera, diarrhœa, in hepatic affections, and in the second and third stage of pulmonary phthisis. In the second division, vomiting proceeds from the brain, in consequence of infection with acute contagion, in the cold stage of intermittent fever, before the eruption of small-pox, in sea-sickness, during operations on the eyes, at the commencement of pregnancy, in hysteria, hypochondriasis, raphania, and from emetics, in apoplexy, tetanus, in inflammations, concussions, and organic diseases of the brain and its membranes.

The prognosis is not aggravated by vomiting proceeding from the nervous system; only where it occurs as a sign of infection it is unfavourable.

The prognostic and diagnostic import of vomiting as proceeding from the intestinal mucous membrane, is regulated by the circumstances under which it takes place, the relief which it brings with it, whether it takes place painfully, easily, or with difficulty, the duration of the vomiting, and according to the circumstance whether the patient vomits all that has been eaten, or only certain articles of food, and lastly, according to the time which elapses between eating and vomiting.

500. Vomiting is favourable, if loathing, nausea, cructation, fulness in the pit of the stomach precede it, and if before it

occurs the white firmly adhering coat of the tongue becomes loose and yellowish, the pulse soft, and the skin moist. These circumstances occur chiefly in catarrhs of the respiratory and digestive mucous membrane. The vomiting is in this case said to be critical.

If opposite states of the tongue, pulse, or skin take place, there is no ground for expecting any amendment from it; the vomiting is then symptomatic.

501. If considerable relief follow the vomiting, if the loathing, nausea, pressure on the chest and stomach, pain of head, disposition to vomit ceases, if the patient fall into a sweat and a tranquil sleep, the prognosis is favourable. If, on the contrary, the phenomena which preceded the vomiting increase after it, if the gastric region becomes painful, the vomiting is of unfavourable import; it is a proof that the disease, besides the matter vomited, has formed other products also, not removable by vomiting; that it is not mere irritation which exists; but that inflammation and its consequences, erosions, ulcers, indurations of the mucous membrane, or cancer, are present. If eructation and hiccup follow a painful and violent fit of vomiting, the disease has taken a dangerous turn. In the same manner, vomiting is a sign of a dangerous disease when, instead of relief, an increase of spasms, distress, &c., follows it.

502. Painful vomiting is mostly a sign of inflammation of the organs included within the abdominal and thoracic cavities, more especially of gastritis, peritonitis, pleuritis; next of affections of the œsophagus and the neighbouring organs; it is also sometimes found to occur in pulmonary tubercles. In these cases the vomiting does harm by increasing the inflammation.

503. Difficult vomiting is a sign of obstruction to the passage of the contents of the stomach, or of a want of due contraction, as in hysteria, cholera, poisoning by arsenic, or of ulcers and wounds of the stomach. In many cases, however, it depends on idiosyncrasy.

Incapability to vomit in spite of all efforts occurs in cancer of the stomach.

If the patient, after long nausea and repeated violent strainings, throws up nothing but a small quantity of albuminous matter, scirrhus of the cardia may be suspected.

Easy vomiting is, in general, better than difficult vomiting. It occurs in gastric catarrhs, gastrodynia, in induration and also in softening of the stomach.

504. The duration of vomiting gives important hints with respect to diagnosis and prognosis.

Chronic vomiting is a sign of an organic change of the intestinal canal or of a neighbouring organ, as of the liver, kidneys, spleen, pancreas, or it is occasioned by diseases of the brain, especially tubercles of that organ. In these cases, the prognosis is bad. But it may also be present without the existence of organic changes in these organs; it then appears to be occasioned by nervous disturbance of the stomach; in this case the prognosis is better. In females this is a more frequent occurrence. If the vomiting, however, resist all known remedies, and there is no sign present of cancer, one may conclude that there is softening or attenuation of the stomach. If vomiting continues for a long time in nervous or yellow fever, the prognosis is bad.

505. An important point to be attended to in vomiting is, whether the patient vomits all that he has eaten indiscriminately after a longer or shorter time, or only certain substances, and whether he bears only a small quantity of food. In acute diseases, vomiting all that has been eaten indicates a more violent affection than mere irritation; it is then a sign of inflammation, of softening of the stomach, or of the intestines.

The rejection by vomiting of certain articles of food and medicines, where it does not depend on the nauseating influence of these ingesta, or on idiosyncrasy, is a proof of irritation, inflammation, or morbid sensibility of the stomach. In this point of view it affords important helps for diagnosis and therapeutics; if the stomach does not bear irritating substances, as wine, bitter or tonic remedies, irritation or inflammation are unquestionably the causes of the affection; if, on the contrary, the stomach can tolerate bitters, iron, &c., we may, in general, infer from this a nervous affection of the stomach.

Chronic vomiting of all solid substances occurs in narrowing of the pylorus, in consequence of cancer of the stomach, and in many forms of gastrodynia. In this, however, some one kind of food, especially of a bland nature, as mucilages, or milk, is better borne than other kinds. If the vomiting is chronic, and is excited by the slightest causes, as the use of water, or of sugar and water, it indicates for the most part softening and attenuation of the stomachic parietes.

506. The sooner the vomiting occurs after eating, the higher up in the intestinal canal is the seat of the disease. If it occur, for instance, immediately after or during swallowing, the cause

lies in diseases of the organs of deglutition and of the surrounding parts, or in some idiosyncrasy.

If it occur from some minutes to an hour after eating, some disease of the stomach is present, more especially irritation, chronic gastritis, or cancer of the parietes of the stomach. Does it not commence till several hours after eating, the pylorus or duodenum is in a morbid state. In diseases of the large intestine it does not occur till the morning of the following day.

507. If the vomiting stops when the patient takes small quantities, either the intestinal canal itself is irritated, inflamed, ulcerated, nervously affected, or there exists a chronic inflammation in other organs, as, for instance, chronic pleuritis.

2. *Signs from the Products of Vomiting.*

508. These vary as to material, colour, quantity, smell, and taste.

The product of vomiting consists of food in case of overloading of the stomach, at the commencement of acute diseases, in gastritis, scirrhus ventriculi, softening of the stomach, in morbid irritability of the stomach, as in gastrodynia, pregnancy, and many cases of fever. The food may be tainted or sound, its quantity small or excessive.

If the chief constituents of the product of vomiting be medicinal substances, the question arises whether these are nauseating or not; then if they are not, it is a sign of disease of the stomach, and yields important therapeutic information.

509. Vomiting of mucus occurs in pregnancy, in gastric catarrhs, in acute and chronic inflammations of the intestinal canal, in nervous affections of the stomach, and yields of itself no information with respect to prognosis.

Vomiting of whitish, serous fluids mixed with flocculi, similar to boiled rice, is characteristic of oriental cholera. Sometimes they assume a light-greenish colour. In cancer of the stomach, large quantities of sour water, or of sour fibrinous albuminous-like masses are often thrown up by vomiting.

Vomiting of bile is a sign of an irritation or of nervous disturbance of the stomach, or of the liver or duodenum. In many thoracic inflammations, the vomiting of bile appears to be accounted for in this way. Under this head also may be classed the vomiting which occurs at the commencement of yellow fever.

Vomiting of fæces occurs in all contractions of the intestinal canal, through internal or external strangulated herniæ, through volvulus, organic changes and morbid growths of the lower portion of the intestinal canal, pressure of another organ, and in peritonitis; it renders the prognosis very unfavourable.

If an individual is seized suddenly with painful vomiting, if the materials vomited excite an extraordinary disagreeable sensation, effervesce on the addition of carbonate of lime, and redden litmus paper,—if there be combined with this acute pain, constipation, or diarrhœa,—there are grounds for suspecting poison.

510. Vomiting of blood (hæmatemesis) is occasioned by exhalation, or by the opening of a small artery, of an aneurysm, or a vein; the blood comes either from the stomach itself or from other organs. Vomited blood is never frothy; it is blacker than blood thrown up by coughing, at least in the majority of cases; it is mixed with food; at the same time, all signs of thoracic disease are wanting; on the contrary, the patient feels a certain fulness in the epigastrium, as also pain and heat; there are also present signs of gastric disease. However, there are cases where vomiting and coughing up of blood occur at the same time.

The prognosis of hæmatemesis varies according to the causes which give rise to it. If it has occurred after the disappearance of a natural discharge of blood, and amidst phenomena of gastric congestion, the thing is not dangerous. If, on the contrary, there are signs present of a gastric affection existing a considerable time previous, as of cancer of the stomach, of an ulceration, of erosion by corrosive ingesta, or if it occurs in scurvy, typhus, putrid fever, or if signs of serious disturbance of the portal system, as in melæna, have preceded, the prognosis is bad.

511. Pus is rarely found in the products of vomiting. It arises either from ulceration of the membranes of the stomach, or from an abscess, which has discharged itself into the stomach. Accordingly it always yields an unfavourable prognosis.

The vomiting of false membranes indicates a violent inflammation; its removal is favourable. The vomiting of oily or fatty substances where they have not been swallowed is a sign of liver disease. Children sometimes vomit tallow-like substances.

The vomiting of worms has nothing suspicious in it, more so than of acephalocysts. The vomiting of intestinal stones is rare; their removal is favourable.

512. The colour of the product of vomiting yields some further important points for prognosis and diagnosis.

Vomiting of black substances is of bad prognosis. It has been observed in ulceration and cancer of the stomach and small intestine, in melæna, in typhus, and in the yellow fever. The black substances appear chiefly to consist of changed blood, if they are soluble in water; if they are not soluble in water, and are so in spirit of wine, they appear to be altered bile.

Green substances in the product of vomiting occur more especially in great debility of the stomach. In children and women of lymphatic temperaments they are frequently a sign of gelatinous softening of the stomach.

Copper-green substances are observed in acute diseases among the precursors of delirium, as, for instance, in cerebral inflammation, and then have an unfavourable import.

Brown substances are vomited in organic diseases of the stomach and duodenum; they always denote serious disease of this viscus, and more especially cancer ventriculi.

513. If a large quantity be vomited, it is always a sign of violent disease; thus, for instance, a considerable quantity is vomited up in cholera, and in the yellow fever. The prognosis is so much the worse, the greater the disproportion is between the quantity vomited and that of the food consumed, and the more dissimilar the product of vomiting is to the intestinal mucus and the ingesta.

514. The taste may be sour, bitter, or rancid; the smell, sour and stinking: sour taste and smell give no diagnostic mark; it may arise from cancer of the stomach, and also from dyspepsia.

What has been said of the vomiting of bile holds good of the bitter taste. Vomiting of substances with a rancid taste is favourable, whilst vomiting substances with a fœculent smell gives a bad prognosis. The smell of sulphuretted hydrogen is found, on the contrary, in vomiting after intemperance, but also in the case of ulcers in the stomach and œsophagus.

Signs from Rumination.

515. In rumination portions of food after being swallowed come back into the mouth without the co-operation of the abdominal muscles, but the stomach and œsophagus alone seem to produce this phenomenon. In many cases it is not occasioned by disease, and then it may be produced voluntarily; in other cases it is

a sign of irritation, of induration of the parietes of the stomach, or of hypochondriasis, hysteria, or of nervous disturbance of the stomach.

Signs from the Gases of the Intestinal Canal.

516. They are occasioned, not by decomposition of the food, but by exhalation of the mucous membrane. They are observed, (1) in all cases where the digestion is weakened, more especially in children, old persons, in persons of sedentary habits, after great mental exertions, after food which is absolutely or relatively difficult of digestion, as sour cabbage, garlic, radishes, &c.; (2) in all irritations and inflammations of the digestive mucous membrane, as in intestinal catarrh, in the case of worms, in gastricismus, enteritis, and in scirrhus pylori; besides in a number of diseases where the intestinal mucous membrane is irritated, inflamed, or ulcerated, as in atonic gout, typhus, and putrid fever, hæmorrhoids, &c. (3) The generation of gas in the intestinal canal is observed to occur in case of hysteria and hypochondriasis, and in windcolick.

517. The exhalation of gas, besides enlargement of the abdomen (*see* 443), produces the phenomenon of flatulence, eructation, and of a rumbling noise in the abdomen, (borborygmus.)

The discharge of gas through the rectum always amends the state of the patient. In ileus it is a favourable sign, in case the cause of the ileus is in the large intestine.

Belching and rumbling noises in the abdomen yield a favourable import in fevers, by their announcing intestinal crises.

If the eructations smell of sulphuretted hydrogen, they are a sign of gastricism, or of ulceration of the stomach, or of the opening of an abscess into it.

SIGNS FROM GOING TO STOOL.

1. *Signs from the Evacuations.*

518. Abnormal evacuations are divided according to frequency into diarrhœa and constipation; in both, the preceding, accompanying, and subsequent phenomena, the duration of the morbid change, the degree of facility with which the excretion passes, and the state of the muscles about the rectum, are to be considered.

The frequency of the evacuations varies according to the age and mode of life. Children at the breast evacuate the bowels several times a day, adults only once, old persons more seldom. Persons who sit much, or eat little, go but rarely to stool. It is usual with many persons, especially recently delivered persons, to go to stool only every two or three days.

519. Purging is always a sign of disease of the intestinal canal. Irritation, with hyperæmia of the intestinal mucous membrane and increase of the normal secretion, frequently gives rise to purging; as for instance, the purging which occurs during dentition in children, in scarlatina, in measles, small-pox, metastatic purging, purging occurring in intestinal catarrh, in helminthiasis, after the use of laxatives, overloading of the stomach, after using many kinds of food, especially those of difficult digestion; as also in accumulation of fæces; also the purging in peritonitis, in hypochondriasis and hysteria, in gout, pneumonia, pleuritis, and child-bed fever. In other cases, on the contrary, purging is occasioned by inflammation of the mucous membrane, of Peyer's glands, and of the glands of the mesentery, by softening of the stomach or intestines, by ulceration of the mucous membrane, as in typhus, chronic dysentery and phthisis, and lastly, by scirrhus of the large intestine.

The chief disease may lie in the intestinal canal, or outside of it; in the latter case, the affection of the intestinal canal is said to be sympathetic. The sympathy depends either on the propagation of one and the same morbid process from other organs to the intestinal canal, as for instance, in the formation of tubercles, or on the occurrence of a morbid process different from the leading affection, as occurs in inflammations of other organs, in the acute exantheams, where hyperæmia and catarrh arise in the intestinal canal. The sympathetic intestinal diseases pass into the idiopathic in cases where a morbid process commences in the intestines and in another organ at the same time, and with the same intensity.

520. The preceding, accompanying, and subsequent phenomena, throw much light on the diagnosis and prognosis.

If the patient has eaten a short time before, one may infer the existence of irritation or inflammation of the mucous membrane; it is a sign of lientery, and yields an unfavourable prognosis.

If vomiting has preceded the diarrhœa, and ceases on the appearance of the latter, this is a good sign; this occurs chiefly in gastric catarrhs, and in overloading of the bowels.

If constipation has preceded the evacuations, the occurrence of diarrhœa is favourable.

Diarrhœas at the commencement of an acute inflammation, which has its seat in an organ not belonging to the chylopoietic system, are in general unfavourable; in later periods of these inflammations they attain a more favourable character, if at the same time the strength hold good. If, on the contrary, diarrhœa sets in with collapse, or at the termination of a chronic disease during the existence of great debility, the prognosis is very unfavourable. If there was abdominal pain before the evacuation, this may arise either from acute or chronic intestinal inflammation, from peritonitis, from lientery, or it may be of nervous origin, as occurs in hysteria and hypochondriasis.

If there is pain in the anus before each evacuation, the cause may be referred to irritation, inflammation, or ulceration of the rectum or colon; to hæmorrhoids or mechanical obstructions of the excretion, as strictures and polypi.

The pressing feel to go to stool (tenesmus) is a sign of a disease of the rectum or colon, more especially of inflammation, of fistulous ulcerations of these parts, or of hæmorrhoids or worms in the large intestines. It may arise also from pressure on the rectum, from abscesses, stones in the bladder, enlarged prostate, from a retroverted or a pregnant uterus. It is most marked in diarrhœa. In hysteria and hypochondriasis it seems to depend on spasm. In the last stage of phthisis, in dropsy, and in cancer of the uterus, it is a bad sign.

521. If the purging is accompanied by continued vomiting, the prognosis is unfavourable; this occurs in cholera, and in poisoning by corrosive sublimate and arsenic. However, tartar emetic also produces similar phenomena, without any grounds for inferring danger from this phenomenon. Pain on going to stool is a sign of a state of irritation, and of the irritating quality of the excrements.

522. If alleviation of the other symptoms follows the diarrhœa, if the strength increases, the prognosis is good and the diarrhœa critical. This is observed to occur in overloading of the stomach, in catarrhs and inflammations of the bowels, in intermittent fevers, in peritonitis, in child-bed fever, in dropsy, in eruptive fevers, in hysteria, and hypochondriasis. If the debility increase with the purging, the prognosis is bad; this occurs in typhus, phthisis, many cases of dropsy, in scrofulous disease of the mesentery, in cholera, dysentery, and in inflammations in old persons. If pain follow the evacuations, there exists a state of

inflammation in the abdomen; the site of the pain generally points out the seat of the inflammation.

523. Long continued diarrhœas occur in chronic enteritis, in ulcerations and tuberculous formation of the intestinal canal, In the two latter cases it is a very unfavourable phenomenon.

If with the diarrhœa there exist a difficulty in the excretion, inflammation of the rectum, strictures, hæmorrhoids, medullary sarcoma of the part, may be the cause.

During the diarrhœa, the sphincter may act with much power, as in cholera and many gastric catarrhs; or it no longer acts, and the evacuation is involuntary. Then either paralysis of the sphincter is present, as in apoplexy, concussion, and organic diseases of the brain or spinal cord, and in injuries of the latter organ; or the cause lies in the state of general debility, as in the nervous stage of acute diseases, or the colliquative stage of chronic.

Local debility of the sphincter may also be the cause; this occurs, for instance, in purging from the rectum, as is observed in case of inflammation, ulceration, prolapsus, and fistulæ of this gut. Here the sphincter does not act without, however, being paralyzed, or without general debility being present.

The involuntary purging which depends on paralysis is worst of all.

524. Tardiness of bowels, and constipation, (*alvus tarda*, *constipatio*,) arise under various circumstances:

(1) Through a morbid state of the intestinal canal and liver; whether this consist in mere diminution of the secretion, with or without hyperæmia, as at the commencement of many acute diseases of other organs, in cases where other secretions are profuse, in chronic diseases of the skin, in consequence of the use of certain substances, as, for instance, of lead, or in irritation or inflammation of the intestinal canal, in the commencement of which constipation is always present, also in thickening of the colon or cæcum, want of contractile power in the rectum (where this is very much stretched) or of other parts of the intestinal canal, as is the case in convalescence, especially from intestinal inflammations; finally, constipation exists in most hepatic affections.

(2) A second class of diseases where constipation occurs are diseases of the brain and spinal cord; thus irritation and inflammation of these organs, hysteria, hypochondriasis, melancholy, mania, and apoplexy, are accompanied by constipation.

(3) Constipation arises through mechanical obstructions, which prevent the progressive motion of the contents of the tube. These obstructions may exist in the contents of the tube, or in its parietes, or finally, externally to this. To this belong scybala, foreign bodies in the intestinal canal, large quantities of indigestible food, stones, conglomerations of worms, thickening of the valvula coli, strictures of the large intestine and rectum, hæmorrhoids, intussusceptions, interlacing of the small intestine, internal and external ruptures, pressure of morbid growths, of abscesses, of calculi, and fungous growths from the bladder, and of dislocations of the uterus.

525. The prognostic importance of constipation is regulated according to the diseases in which it occurs.

It is normal after the use of most purgatives, after severe purging, in case of copious secretion from the skin or kidneys, and at the commencement of acute diseases. Here it has no bad effect on the prognosis; it even renders it generally favourable. On the contrary, in the latter stage of fever, towards the time of the crisis, constipation is unfavourable, in case no other secretions take place. Constipation in chronic diseases of the brain, or through mechanical obstructions, especially if these lie in the intestines, yields an unfavourable prognosis.

526. The diagnostic and prognostic import of constipation is further explained by the accompanying phenomena.

If constipation occur with vomiting, the prognosis is not bad; much better than if diarrhœa and vomiting coexist. It is, on the contrary, of unfavourable import when, after long constipation, vomiting sets in, with pains in the abdomen (ileus); it arises from mechanical obstructions in the intestinal canal, and during violent intestinal inflammations which are occasioned by acrid poisons. If the constipation and pain cease suddenly under these circumstances, and great debility sets in, with continuance of the vomiting, the prognosis is very bad. In like manner, constipation, with pains and enlargement of the abdomen, render the prognosis worse.

If constipation set in suddenly during a disease in the place of diarrhœa, it is commonly unfavourable. If the strength improves on the occurrence of the constipation, it is favourable.

In chronic diseases of the lungs, of the serous membranes, and in diseases of the extremities, a tardy state of the bowels is better than diarrhœa.

If purging alternate with constipation, irritation or inflammation in the intestinal canal, and, in the case of children, also in the mesenteric glands, is to be suspected.

527. The longer the constipation continues, the worse is the prognosis, more particularly in case of mechanical obstructions in the intestinal tube ; on the contrary, in mania, melancholy, and in the case of old people, long continued constipation is of less consequence.

If during the existence of costiveness there be an urgent desire to go to stool, hæmorrhoids are the occasion of it.

2. *Signs from the Alvine Evacuations.*

528. The matter of evacuation varies, in the healthy state, according to the age, and according to the food used. New-born children discharge the meconium, children at the breast pass much fæces of pap-like consistence ; adults a smaller quantity, and mostly soft substances ; old persons still less, their fæces are hard and globular.

People who eat much usually pass much fæces, except convalescents.

Sedentary habits of life and meat-diet yield less fæces than a mode of life with much muscular motion and vegetable diet. The colour varies according to the food taken, and according to the medicines used, and the age. In children, the fæces are yellowish ; in adults, brown ; in old persons, a dark brown. Green herbs, especially spinach, give the fæces a fine dark green colour ; black red fruits and iron give it a black colour ; rhubarb a yellow colour ; sulphur gives them a strong odour of sulphuretted hydrogen.

In diseases, the excrements vary as to quantity ; also as to the substances to be recognised therein, with respect to their sistance, form, colour, and odour.

529. The quantity is considerably increased in all acute affections of the intestinal canal itself, at least in their later period, particularly so in gastric catarrh, in intestinal inflammation, diarrhœa, cholera, ulcerations in the intestinal canal, in consequence of typhus, or phthisis. Profuse diarrhœa with diminution of strength is called colliquative. Small quantities of fæces are commonly connected with tardy bowels ; they are also observed to take place when there exist mechanical obstructions in the intestinal canal, at the commencement of

acute affections of the bowels, and of other parts, as well as in profuse secretions of the skin, kidneys, &c.

530. Among the substances distinguished in the excrements may be enumerated food, serum, mucus, bile, pus, fat, blood, milk, false membrane, portions of intestine, urine, calculi, and worms.

531. If digestible substances pass away half, or not at all digested, this is a sign of irritation or inflammation of the intestinal canal, or of weak digestion, mostly in consequence of chronic enteritis and gastritis, of diarrhœa, and of cholera. This state is partly called lientery. It may occur in hysteria, hypochondriasis, and hepatic diseases.

Serum, which sometimes resembles clear water, and at other times is rendered turbid with flocculi, sometimes is like a watery mucilaginous mixture, is observed in all irritations of the intestinal canal, in cholera, (where it resembles boiled rice,) in suppression of profuse secretions of other organs, after purgatives, especially saline purges and calomel, in nervous fevers, and in dropsy. In chronic diseases of the intestinal canal, and of the liver, &c., the serum is often like to a brown animal broth; this was called the fluxus hepaticus. Spontaneous evacuations of the serous kind do not alleviate the disease, except sometimes in dropsy, if the disease is of but short duration, and the patient is still strong. In chronic diseases of the liver and intestinal canal it is a bad sign.

Thin fluid mucus is a sign of intestinal catarrh; the thick thready kind indicates the chronic forms of catarrh, and of inflammations of the intestines; it is observed to occur in patients who are affected with hæmorrhoids, hypochondriasis, infarctions, in children with remittent fever, in persons whose intestines are irritated by scybala, and after diarrhœa. Viscid mucus yields a worse prognosis than that which is thin.

Purulent mucus, as other mucous membranes secrete it, occurs in the intestinal canal under the same circumstances as in those, namely, in chronic enteritis and gastritis, in disorganizations of the liver, of the mesenteric glands and pancreas. This kind of evacuation is called fluxus cœliacus.

532. Pure bile and excess of bile in the excrements occur during irritation of the duodenum, or liver; accordingly it occurs in persons addicted to intemperance, or in persons who return from hot climates, and after a violent fit of passion.

Pus is seldom found in the excrements, only when there is

ulceration in the rectum and large intestine, or when considerable abscesses of the liver, spleen, kidneys, and uterus, or of the cellular tissue in the abdomen and pelvis, open into the intestines.

Passing of fat occurs in phthisis tuberculosa, in which case also fat is frequently found deposited in the liver, and in hepatitis.

533. Passing of blood through the anus, unless it has been swallowed, is always a sign of hyperæmia, irritation, inflammation, wounding, ulceration of the intestinal canal, of disease of the portal system, or of dissolution of the blood. Bloody stools are accordingly observed in helminthiasis, in contractions and concretions in the intestinal canal, in diseases of the spleen and liver, in hæmorrhoids, as vicarious for menstruation, in diarrhœa, cancer, and fungus of the intestinal canal; also in typhus and variola, in purpura and scurvy, in cholera and phthisis, and lastly, in the case of an abscess opening into the intestinal canal. If the blood is of a clear red colour, it comes from the rectum and the lower portion of the large intestine; when it is of a dark red colour, it comes from the higher parts.

Blood without fæces comes from the small intestine. This occurrence appertains more especially to typhus. If the passing of blood precedes the fæcal evacuation, the large intestines are the seat of the bleeding; that which passes after the fæcal discharge comes either from the small intestine or from hæmorrhoids.

If the passing of blood is considerable, there is present either a wound, ulceration, disease of veins, or dissolution of the blood, as in typhus, variola, scurvy, purpura, and in hæmorrhoids; a profuse loss of blood through the anus is dangerous. In inflammations of the intestinal canal, but little blood comes away.

If relief follows the discharge of blood, it is a favourable sign; this is found in inflammation of the spleen, liver, bladder, intestinal canal, in typhus, as also in hæmorrhoids and in all diseases occasioned by stopping the bleeding from them. In variola and cholera the loss of blood through the anus is a bad sign. In little children it is less unfavourable than in old persons and adults.

534. The milky evacuations, as well as the chalky evacuations of Mason Good, and those of a chylous character, have not been confirmed. Their peculiar appearance these evacuations owe, it would appear, to the want of bile. If eva-

cuations resembling these substances continue for a length of time, the prognosis is suspicious.

False membranes, which pass away through the anus in the form of flocculi, streaks, or tubes, are, unless they occur in diarrhœa, the product of a peculiar chronic inflammation of the small or large intestine, which may be combined with diarrhœa or constipation, or with both alternately, and forbodes a long duration of the disease, (infarctus.)

Portions or even knots of intestine may pass away in a gangrenous form by stool, and still the patient recover.

Biliary and intestinal calculi are sometimes found in the excrements. In case of fistulæ between the rectum and bladder, the urine passes from the anus.

The passing of worms (*tænia lata* and *solium*, *ascaris lumbricoides*, *oxyuris vermicularis*, *distoma hepaticum*, and *tricocephalus dispar*) is in many diseases an important diagnostic and prognostic sign. If the symptoms of disease abate with the escape of the worms, as happens more particularly in chronic diseases, this is a sign that they were called forth by the worms, or at least made worse by them; the prognosis is then favourable. In typhus, on the contrary, the passing of worms coincides mostly with the deterioration of the disease, or precedes it.

535. The consistence of the evacuations presents several varieties. The watery consistence occurs in the serous and mucous evacuations. The pap-like consistence is observed at the end of the watery stools, and in chronic inflammations, in hypochondriasis, in infarctions, and after the use of sulphur. The evacuated masses are viscid in jaundice, in chronic enteritis, and in what are called infarctions. Very solid masses are observed in case of stricture in the intestinal canal, in case of schirrhous pylori, in lead colic, in melancholy and mania.

536. The form is more particularly changed in all forms of sluggish bowels; it becomes mostly globular. If only solid globules are passed without fluid, the cause is to be sought in merely functional states of disease. If fluid is also passed with these globules, strictures are present in the rectum and large intestine, (the passing of several small conglomerated little balls, is more particularly characteristic of it,) or hardened fæculent masses lie in some part of the intestinal canal. The band-like, flattened, quilled, round, long-drawn, as also the coagulated evacuations, are on the whole signs of narrowing and degeneration of the rectum.

537. The various colours proceed partly from the mixed sub-

stances above noticed, and partly from the varieties of the secretion of the mucous membrane and of the liver. Thus the white colour arises from want of bile in diseases of the liver, duodenum, and stomach, or from an excess of the mucous secretion in catarrhs and inflammations of the mucous membrane. Yellow evacuations occur more particularly in inflammation and ulceration of the intestinal mucous membrane, as for instance, in typhus and abdominal scrofula, as well as in many degenerences of the liver.

The brown evacuations contain a due quantity of bile; they are observed in liver diseases, in inflammation and ulceration of the duodenum and ileum, and in hypochondriasis.

In the green evacuations, the stomach and duodenum appear more particularly to suffer; they are observed in the inflammations of these parts, in gall-stones, in case of acids in the stomach, and in hydrocephalus acutus.

Red evacuations are occasioned by the admixture of blood, (*see* 533.) The black colour of the evacuations is either occasioned by bile—then the colour is not soluble in water; it is in this case a sign of the yellow fever, of bilious fever, or of severe hepatic disease, and should accordingly be considered as a very bad phenomenon,—or the black colour is somewhat soluble in water, and it is accordingly occasioned by blood; this may be observed in most diseases where blood enters the intestinal canal. Grey evacuations of a pap-like consistence are observed in enteritis; grey and very fluid evacuations in cholera.

538. The evacuations are devoid of odour where the substances are rapidly excreted; the food is then generally but half digested; they are extremely fœtid when they have tarried for a long time in the intestinal canal, as, for instance, in melancholic persons, and in case of the admixture of pus, as in typhus, phthisical and dysenteric ulcers of the intestines, in all cases where debility predominates, as in the diarrhœas of aged persons, in many gastric catarrhs and worm fevers, accompanied with great debility. Fœtid evacuations are in general unfavourable, more especially in tubercular phthisis.

IX.

SIGNS FROM THE PARTS OF GENERATION.

Signs from the Male Parts of Generation.

539. THE retention of the male genital parts in the development of the body is a sign of a general state of disease interfering with and impeding nutrition, more especially of scrofula, of diseases of the stomach, lungs, and brain. Extraordinary size of the penis is a sign of sexual excesses ; in boys it is a sign of onanism, of calculus in the bladder, and of chronic diseases of the portal system. Unusual smallness of the same organ, and long-continued dependence of the scrotum, indicates partly local debility of the genitals after violent and repeated excesses in sexual enjoyment, and after onanism, whilst it sometimes indicates general debility of body. These cases of smallness of the penis must be distinguished from those instances where a portion of its skin is involved in hydrocele or scrotal hernia. In violent pains in the abdomen the penis appears to be extremely small. Clear, transparent vesicles grouped on the prepuce and glans, followed by desquamation in thin, small, flat scales, and which sometimes occasion excoriations, which also form groups, are a sign of herpes præputialis. Pustules which subsequently change into elevated, thick crusts, ulcers on the penis and scrotum, and excrescences on the genital parts, are of syphilitic origin. Parts somewhat elevated, which secrete small, thin scales, without having been preceded by vesicles, are a sign of psoriasis. They appear on the scrotum and penis, generally, however, at the same time on other parts of the skin. Very small transparent vesicles, which at a subsequent period run into an inflamed smarting surface, constantly secreting scales or serum, indicate eczema. If the fluid of the vesicles, at first clear, then becomes turbid, the disease is eczema impetiginoides. Lastly, the scrotum is the favourite seat of chimney-sweeper's cancer.

540. The want of testicles indicates cryptorchy and impotence. Their being drawn towards the inguinal ring occurs in violent pains in the abdomen, more especially in inflammation

of the bladder, nephritis calculosa, stone in the bladder, in neuralgia, ileo-scrotalis, and in cramps. Swelling of the scrotum indicates rupture, when it is drawn into the open inguinal ring, is replaceable, and a rumbling noise is heard on attempting to replace it. We shall be warranted in concluding that the case is hydrocele, if the swelling has commenced at the bottom of the sac, if it be tense and transparent, if there be fluctuation, if it occasion no pains, at least in its advanced stage, and is connected with no signs of indigestion.

If the tumour consist of soft compressible cords, and diminishes in the horizontal position, it is varicocele. If a swelling of the epididymis is composed of several small vermiform cords, painful on pressure, and if it has commenced with a feeling of pressure and tension, it is spermatocele. A hard, uneven, knobby, tumour, with lancinating pains, characterizes scirrhus of the testicle. A uniform, painless, large tumour, simulating fluctuation and running abruptly into the abdomen, indicates the existence of medullary sarcoma, (markschwamm.) A heavy, uniform, painless tumour, of the form of the testicle, and without being continued to the spermatic cord and into the abdomen, indicates sarcoma of the testicle. Inflammation of the testicle, and the consequent induration, thickening and serous infiltration of the cellular tissue of the scrotum, effusion of pus or of blood into the same, a varicose state of the scrotum, likewise occasion tumours, which are distinguished from the above as well by the history as by the accompanying phenomena and the feel. The testicle sometimes swells in consequence of metastasis, as for example, in parotitis, typhus, &c.

Want of erection occurs in impotence, in general debility, in diabetes, and in some chronic diseases of the brain. Moderate erections indicate in fever patients the commencement of convalescence. Too frequent erections when the external occasions are inconsiderable, and even without any such, are a sign of irritation of the sexual organs through onanism, or sexual abuses, or through inflammation and ulceration on the penis, or irritation occasioned by stone in the bladder, acrid urine, and ascariides of the rectum. Continued erection (priapism) is sometimes the consequence of deficient seminal secretion; it is, however, most commonly occasioned by catarrhs, inflammations and hæmorrhages from the bladder, stones in the bladder and kidneys, and by gonorrhœa; it has also been observed in diseases of the cerebellum, in epilepsy, hypochondriasis, erotic melancholy, and in many cases of acute diseases attended with great debility.

It becomes painful in cases where inflammation of the penis or bladder or where gonorrhœa is the cause, more especially when the concavity of the penis looks downwards, (chordée.)

542. The secretion and excretion of semen presents several deviations from the normal state. Deficiency in the seminal secretion is a sign of atrophy of the testicle, of disease of both testicles, and of impotence. Excessive seminal secretion is a sign of plethora and of irritation of the genitals. Involuntary discharge of semen by day, without erection, during riding or whilst evacuating the rectum or bladder, is a sign of debility of the genitals and of dilatation of the ejaculatory ducts. In tabes dorsalis it gives an unfavourable prognosis. Discharge of semen at the commencement of an erection is a proof of debility of the genital organs, as it is produced by sexual excesses.

Defective ejaculation of the semen is a sign of debility of the genitals, or of mechanical obstructions, as strictures of the urethra, narrowness in the orifice of this canal, hypospadiæ, &c.

543. Want of sexual desire is natural at the commencement of all acute diseases; it is further produced by degenerescences and atrophy of both testicles, by great debility, and cerebral disease.

Signs from the Female Parts of Generation.

544. The female genital parts are much more intimately connected with the entire system than the corresponding parts in the male. Whilst the latter stand in close relation only to the nervous system, an intimate reciprocal action is found to exist in the female genitals with the sanguineous system and the system of nutrition. The signs which may be obtained from them may be referred to the condition of the organs, the sexual inclination, and the secretions from the female genitals.

A retardation in the development of the female genitals after puberty, is either a sign of deficiency or atrophy of the ovaries, or it is occasioned by chronic diseases, particularly scrofula and rachitis.

A proportionally too wide vagina is a sign of onanism, of the fact of coition having taken place, of the births of children, of prolapsus of the vagina and uterus. Ulcerations and warty excrescences are a sign of syphilis; eczema and psoriasis also come on the female genitals. Swelling of the labia may be occasioned by inflammation, (sometimes the result of metastasis in erysipelas and parotitis,) by œdema, extravasated blood, &c.

545. Uneven hardness of the cervix uteri indicates scirrhus ; ulcers indicate syphilis, scrofula, and cancer of the same. Pain on touching the part, elevated temperature, and great softness, are signs of metritis. When the uterus is in a state of inflammation, it presents an increase of weight, but in a higher degree, however, in degenerescences, in morbid growths, and in pregnancy.

If the os uteri is round, there is a morbid tumour on the cavity of the uterus, unless pregnancy or menstruation be the cause. If a body presses forth from it, this, unless parturition is commencing, must be the retroverted uterus, or polypus. Fungous growths at the os uteri are a sign of cancer. The changes in the direction of the cervix uteri denote dislocations of the uterus. They are occasioned by relaxations of the ligaments of the uterus, degenerescences at the fundus of the organ, and pressure of some neighbouring organ in a state of degenerescence.

546. Menstruation affords by its occurrence, by the accompanying phenomena, and the quantity and quality of the secretion, very important signs. A too late appearance of this secretion may be occasioned as well by chronic diseases as by a laborious mode of life. Too early occurrence of menstruation is a proof of an early perfection of growth. If its appearance is too long retarded, either an organic malformation, such as absence of the uterus, imperfect vagina or of the os uteri, or great debility, must be the cause.

If menstruation be accompanied with great pain, spasms, nausea, and vomiting, there is present either a local morbid state of the sexual organs, as degenerescence of the uterus, considerable narrowing of the vagina, chronic inflammation and degenerescence of the ovaries, or hyperæmia of the intestinal canal ; the liver and spleen are enlarged ; or, finally, general debility may be the cause of the painful menstruation. Morbid retention of the menses occurs in most diseases affecting the entire system, particularly in fevers, then in inflammations, in diseases also accompanied with spasm, in tubercles of the lungs or of the intestinal canal ; also in metritis, in degenerescences and morbid growths affecting the internal genitals. Retention of the menses may be followed by congestions to other parts, more especially to the intestinal canal, to the lungs and to the brain, which may ultimately give rise to inflammation, hæmorrhage, morbid secretions, and disturbances of the nervous system. The consecutive states occur in a much more acute form in suppression of the menstruation.

547. Thick, dark, menstrual blood is a sign of disturbance and plethora of the intestinal canal, engorgement of the spleen, disease of the portal system, unless it acquires this property by retention of the discharge. It is pale and thin in chlorosis, anæmia, phthisis, and dropsy. The secretion is scanty in the lower grades of those diseases which occasion amenorrhœa, and also in hyperæmia of the intestinal canal, in what are called infarctions, and in hæmorrhoids. Too profuse and too long continued menstruation is a sign of plethora, of increased vitality of the sexual organs at the expense of the other organs, or of great debility of the same; it is critical in metritis, it is also observed in intestinal inflammations, in chronic inflammation of the ovaries, and in ulceration of the uterus. It may be followed by abortion in pregnancy, also by hysteria, degencrescences of the generative parts, more particularly of the ovaries and uterus.

548. Bleeding from the female parts of generation, occurring not at the period of menstruation, happens both from opening of the vessels as well as in the way of transudation. If it is not occasioned by wounds, by rupture of the uterus, or other states connected with inflammation, it is a sign of ulceration, chronic inflammation, fungus hæmatodes, fibrous tumours, polypi, cancer, dilatation of the veins of the uterus or of the vagina, and therefore generally yields an unfavourable prognosis.

549. The mucous discharge from the parts of generation (fluor albus) whereby a whitish or yellowish, a mucous or even a purulent fluid, is secreted, may depend on local morbid states of the uterus and vagina, or its cause lies outside the generative parts, in a disturbance of the other organs. Under the former class may be enumerated irritation of the vagina or uterus, gonorrhœa, inflammation of the mucous membrane, suppression of menstruation or of the milk secretion, great debility of the parts of generation after profuse menstruation, child-birth, &c. Also indurations, polypi, steatomatous tumours, scirrhus of the vagina and uterus, inversion and change of position of the uterus; finally, pressure on the internal parts of generation, and sympathetic irritation of them from the bladder or rectum. Where these morbid states are not present, the causes of fluor albus are to be sought at one time in general debility of the system, as may be produced by violent exertions, too long continued suckling, and pinching poverty, sometimes in general plethora, and at other times in a tendency to mucous secretions, as in scrofula. In intermittents and in inflammations the mucous discharge from the vagina is to be considered as favourable. From the

mucous discharge we must carefully distinguish the secretion of pus, which indicates ulceration of these parts, and that of ichor, which indicates presence of cancer. A serous discharge may occur instead of the mucous, or may be caused by hydatids and dropsy of the uterus.

550. The lochia vary in quantity and quality according to the age, the number of previous child-births, according to the constitution, manner of living, nursing, &c. Profuse lochial discharge is produced partly by local morbid states, as irritation, deficient contraction of the uterus, retention of the placenta, polypi, and other degenerescences of the uterus, and by change of position of this organ; it may arise partly from general plethora and fever, or general debility, more especially if the juices of the body are directed by any circumstance whatever to the uterus. Scanty lochia are peculiar to many women without a morbid cause; besides, they are occasioned by diversion to other organs, as in profuse perspirations, copious secretion of milk, inflammations of important organs, or by irritation and inflammation of the uterus. Such a state also sometimes occurs during great debility, and in anæmia.

Scanty lochia give reason to apprehend a chronic inflammation. Still worse is the suppression of the lochia; it occasions inflammation of the uterus, diaphragm, uterine veins, &c. If the lochia continue too long bloody, they have the same import as those which are too profuse; those which are watery are analogous to the scanty form of the secretion. Purulent lochia indicate suppuration of the uterus, and are critical in metritis; false membranes sometimes form in this disease.

551. Want of sexual desire in the female sex is a consequence of great debility, or of the want or degenerescence of the ovaries and uterus. It is generally connected with the tardy appearance, or with the absence, of menstruation. In acute diseases, sexual desire ceases in the female, whilst its return is a sign of convalescence. Excessive venereal desire, which may amount even to nymphomania, is a sign of irritation, of chronic inflammation, or other morbid state of the ovaries, more especially where the vegetative process is strong, and where there is cerebral excitement. Sterility, unless the cause rests with the male, or depends on his relation to the female, arises from the impossibility of sexual connexion taking place, or from debility, irritation, inflammation, degenerescence of the uterus and ovaries, as also from undue form and position of the parts of generation.

Signs from the Breasts.

552. The uniform swelling of the breasts at the termination of pregnancy is natural. At other times it presents itself in case of irritation of the uterus and ovaries, in suppression of the menstruation, and in inflammation of the mamma. Knotty swellings in the breast are a sign of stoppage of the milk secretion, of partial inflammatory indurations, of tubercles, cancer, and hydatids. The breasts become flaccid before the natural time in consequence of debilitating chronic diseases. Pains in the nipple, unless produced by inflammation, excoriation, or ulcers, indicate irritation, inflammation, and degenerescence of the uterus.

Pains in the breasts are a sign of the commencing of the milk secretion, or of its obstruction and stoppage, and also of inflammation of the breasts; lancinating pains occur in cancer of the breast. Inordinate secretion of milk is a sign of weakness of the mamma, with an afflux of the mass of juices towards the part. If it continue for a long time, it affords a rather unfavourable prognosis, as it is frequently followed by great debility, by phthisis, and nervous affections. Suppression of the milk secretion leaves room to apprehend congestions in other organs, hæmorrhages, abnormal secretions, and inflammations.

THE END.

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