DISEASES OF MAN:

DATA OF THEIR

NOMENCLATURE, CLASSIFICATION & GENESIS.

To describe is to particularise.

"Words are the fortresses of thought."

"In words are contained the sciences possessed by the nations of the earth...."

To define is to generalise.

Definition is the summary of description.

"Perfect definition is the summit of human knowledge in every part of science...."

"To name is to know."

"The true progress of science must always be realised in names."

"Things are known when understood and are understood when interpreted."

"The perfection of a science depends, in no inconsiderable degree, upon the perfection of its language; and the perfection of every language upon its simplicity and precision."

"To think is to classify,"

and to classify is to think.

"System is the Ariadnean thread without which all is confusion."

"Classification is not attainable by art only, it requires a mind that is capable of distinguishing things by their specific differences; not separating things that are alike nor blending things that are different."

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BY

JOHN W. S. GOULEY, M. D.,

SURGEON TO BELLEVUE HOSPITAL.

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PREFACE.

The objects of this book are ; first, to urge the official adoption of a stable basis for the nomenclature and classification of the diseases of man ; second, to place before the medical profession certain propositions directed to an improved classification of diseases ; and third, to awaken the attention of teachers to the necessity of ameliorating the nomenclature of medicine, pointing out some of the many misused and improperly formed words that are now current, and proposing new terms for their consideration.

In attempting to classify the affections of the male uro-genital apparatus, it was found difficult to do so satisfactorily, owing to the defects of the existing nomenclature. This led to an inquiry into the former and actual state of nosonomy and nosotaxy, and into the methods employed by nosographers from the time of Sauvages to the present. The conclusion arrived at, is that a nomenclature and classification to be useful and stable should not only rest upon a proper foundation, but should be duly authorised by the whole profession of medicine. The principles deduced from an analysis of the methods of nomenclators and classifiers are now submitted to the profession; and certain questions are suggested for discussion in, and for settlement by, the International Medical Congress which properly represents the medical profession.

The presentation of this subject to the profession is designed as a plea for the more systematic study of diseases, and as an individual protest against their existing nomenclature and classfication, with the hope that this protest will become general among teachers and others who realise the necessity of bettering the condition of medicine, without undertaking to destroy its fabric in order to reconstruct it; but rather to modify, simplify, and improve it by gradually substituting exact terms for those that have never conveyed correct ideas.

During the preparation of this book, more or less frequent consultations were held with Doctors Clymer, Carroll, Flint, Biggs, Cronyn, Taylor, Clark, Leale, Grauer, John Shrady, Edmund Arnold, and others. The valuable suggestions of these kind friends are gratefully acknowledged.

Botanists, Mineralogists, Biochemists and Philologists have been consulted with much advantage and their hints have been thankfully received and carried out.

Works on Botany, Zoology, General Chemistry, Biochemistry, Physiology, Descriptive Anatomy, General and Special Pathology, and Surgery, and many of the treatises on nomenclature and classification have been freely used. A general acknowledgment is made to the authors of these works which have been of the greatest service in this endeavor to elucidate the principles of nosonomy and nosotaxy.

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CORRIGENDA.

Page 36, second line, for propylactic, read prophylactic.
" 40, foot note, for celibary, read celibacy.
" 48, V. 8, for (obsteoma), read (osteoma).
" 56, foot note, for *εγγευης*, read *εγγενης*.
" 63, " " for *οργανου*, read *οργανον*.
" 67, tenth line, for antonomous, read autonomous.
" 69, fifth line from bottom, for corect, read correct.
" 102, IX. I., for sangninfluxus, read sanguifluxus.
" 150, fourth line, for comea, read cornea.
" 212, first line, for authorites, read authorities.
" 255, foot note, for *ι΄πό*, read *ύπό*.
" 326, " " " " " "
" 365, third line from bottom, for *ωοις*, read *ωσις*.
For Laënec read Laënnec.

INTRODUCTION.

1. This book is divided into five sections. The first section comprises: some anatomical considerations of the normal human body; a statement of the objects and scope of medicine; a classification of medicine; the mutual relations of medicine and surgery; an arrangement of medicine into departments in accordance with the apparatuses of the human body; the definition and genesis of disease; a synopsis of the morbid states and morbific processes of the body, designed as a suggestion of a ground-work for the classification of diseases; and an analysis of some of the anatomical terms used in classification. The synopsis of morbid states and morbific processes stops at genera, but a few species are given in foot-notes.

The second section relates to the history, development, scope and significance of human nosography, and contains synopses of a considerable number of systematic arrangements of diseases, illustrative of the principles of nomenclature and classification, and also rules for the guidance of nosographers by Cullen, Parr, Young and Linnaeus.

The third section consists of a nosographical bibliography, chronologically arranged, from the time of Felix Platerus.

The fourth section is devoted to the elucidation of what is conceived to be a proper basis, character, and method of the nomenclature and classification of the diseases of man: and to the definitions of the terms of classification.

The fifth section is intended as further explanations of the morbid states and morbific processes, and as an analysis of some of the terms used in general pathology, besides which it embodies a summary of the present state of knowledge of the bacteria, ptomaines, leucomaines, and "extractives," and indicates the relations borne, to medicine and surgery, by these microörganisms and toxic alkaloids of putridity, and finally remarks on the neoplasms and on their classification.

2. This work is undertaken with the hope that it will induce all those devoted laborers in the field of medical science who are struggling so diligently to solve great problems in physiology, histology, pathoanatomy, and therapy, to consider how much assistance methodical arrangement will afford them in their investigations and how much of their time will thereby be saved;

also how important it will be for them to adopt a correct and uniform nomenclature. They will then probably reject all inexact terms and coin words,—"*verba-fidelia*"—in accordance with the conditions they wish to designate with precision.

In medicine, the coinage of a new word is attended with some difficulty and requires much deliberation, besides the censorship of men of experience and sound judgment. The word should then be submitted to the profession, whose verdict on the question of its general adoption should be respected. On this subject of the coinage of words, Ben Jonson says: "A man coins not a new word without some peril, and less fruit; for if it happen to be received, the praise is but moderate; if refused the scorn is assured."

At present, a very considerable part of the nomenclature of medicine consists of such a great number of inappropriate, incorrectly formed and misleading terms, that often it is not easy, for investigators, even of the same nation, writing in the same tongue, to understand each other.

"It is a waste of time," says Mill, in his *Examination of Sir William Hamilton's Philosophy*, "for a mere student of philosophy to have to learn the familiar use of fifty philosophic phraseologies." This applies with much force to the many anatomists and medical investigators who use words of their own invention which others are at great pains to understand.

3. While the progress made in medical art during the last quarter of a century is marvelous, the improvement in the *nomenclature* has by no means kept pace with this great advance in the *art* of medicine. Accuracy is often attained in the latter while it seldom obtains in the former. If more attention were given to the formation of scientific language, much confusion and misapprehension, which have the effect to impede the progress of medical science, would be avoided.

The technical terms of medicine derived from the Latin and Greek tongues are used partly for the sake of brevity and partly that they may be understood by the medical profession of the different nations that cultivate the dead languages. Unfortunately however the cultivation of these languages is too limited among physicians. As a consequence, many meaningless expressions and as many hybrid words, compounded of Latin and Greek and sometimes of Hebrew roots, very distasteful to the experienced scholar and serving to puzzle rather than to instruct the junior student, are constantly used in text-books and other works. The few modern writers who have undertaken the task of improving the nomenclature of medicine are little heeded, and professors in the great schools are still thoughtlessly disseminating false notions by the careless use of inaccurate expressions in their daily lectures. Many ancient words, however inexact and absurd, are adhered to with great tenacity, and innovations the most appropriate are resisted with an obstinacy too little in keeping with the forward movement of the time. Conservatism is praiseworthy when applied to words that have stood the test of years and are still adjudged good and proper. Those time-honored terms which convey ideas with precision should be jealously preserved; but that multitude of misleading expressions, to be found in the literature of medicine, should be speedily blotted out of coming medical treatises and dictionaries, and their places filled with well chosen and philologically correct words.

If teachers in the several departments of medicine will earnestly consider this subject, and if each will contribute his share to the reformation, in another quarter of a century there will surely be a more uniform and exact medical language.

The needed reformation in medical nomenclature should however be rightly directed, and those who undertake it should be mindful of Lord Bacon's precept that "It is good also, not to try experiments...... ; except the necessity be urgent, or the utility evident: and well to beware that it be the reformation that draweth on the change; and not the desire of change that pretendeth the reformation."

4. It is improbable that the often repeated statement, "it is not profitable to attempt to change the present methods of writing and of teaching medicine owing to its great mutability," will deter nomenclators and classifiers from the pursuance of their investigations, but it is a fact that they are too little encouraged, even by those who realise the necessity of a radical change in these methods. Exact nosonomy and nosotaxy will surely cause greater changes and advances than have ever been made in medicine. To give correct names to diseases involves the closest inquiry into their nature. It is therefore fair to assume that the time will come when the name given to each disease shall indicate its nature. When this good time does come, medicine will be taught as other sciences are taught. The consideration of the advances destined to be made by a methodical nosography, leads to the conclusion that it must keep pace with the advancement to which it has given rise, and must of necessity be provisional.

5. The inexact nomenclature of diseases, and the defective arrangement and inconsistencies in existing systems are such that it is almost impossible for the student to learn medicine as he should; and, in view of its continued advances, this will be quite impossible in a quarter of a century, unless a radical change be made first in the nomenclature of anatomy and next in the nomenclature and classification of diseases.

Without an accurate nomenclature and classification, the one hundred and twenty thousand flowering plants could not have been known, nor could the immense number of species of animals be studied, and it would not have been possible to obtain an accurate knowledge of minerals. Thus Botany, Zoology, and Mineralogy, have for many years, taken each a high rank among the sciences owing to proper nomenclature and to methodical arrangement.

The science of medicine will never progress as it should and will never be learned as it should be learned until it is placed upon the same footing as that of the natural sciences.

Without an accurate nomenclature and classification it is very difficult for the practising physician to have the clear understanding of diseases so necessary to their rational treatment. All morbid states of the human body should be known by names that indicate their nature, and it is only a right conception of this nature which can lead to the use of appropriate remedies.

6. The terms nomenclature and classification of diseases do not by themselves express with sufficient precision the scope and objects of systematic arrangement. Therefore the word nosography should, in its broadest sense, be employed to signify the whole, or some part of the science of medicine as, for example, human nosography, nosography of the uro-genital apparatus, or of any other apparatus of the human body.

7. It is often said that language fails to express with accuracy the ideas which man conceives of things. Sweeping as this statement may seem, it is defensible, particularly in the case of medical language which so much needs reconstruction. That however which causes the greatest perplexity in the expression of ideas, is the misapplication of words, and also their employment in different senses, so as to give to each several meanings. Since it is not probable—at least not for a very long time—, that human language will consist of words having each a single meaning, the most judicious use should be made of existing terms and the greatest care taken in the formation of new words; and all writers should strive

to give a clear exposition of their ideas by sometimes explaining the words of many meanings which they are obliged to employ. Some of the great faults in medical language are: (1,) the misapplication of words; (2,) the use of improperly constructed words; (3,) the use of words which do not convey an exact idea of the object designated; and (4,) the use of men's names to designate diseases. These faults are all remediable, but to repair them most effectually and to prevent their recurrence, a consense of views in the medical profession is absolutely necessary; then the changes in terms will be uniform, will come authoritatively, and will therefore be accepted.

It appears that medicine is not the only science whose progress has been hindered by abuses in terms.

In his Elements of the Philosophy of the Human Mind, Dugald Stewart says: "When I consult Johnson's Dictionary, I find many words of which he has enumerated forty, fifty, or even sixty different significations; and, after all the pains he has taken to distinguish these from each other, I am frequently at a loss how to avail myself of his definitions."

A great thinker and metaphysician comments, as follows, upon words and deplores their wrong usage.

" ......In words are contained the knowledge and sciences possessed by the nations of the earth...... A strict adherence to propriety in the use of words, is the only means for maintaining clearness of ideas, for preserving and harmonising them...... Many ancient and modern sophists, and many profane philosophers, sought artfully to alter the true value and force of words. The world could scarcely be deceived except by such alteration. Abuse has been made of almost all philosophical and political terms, as has been frequently shown by various writers. Whoever takes note of the errors that have arisen from the abuse of the word *Nature*, in the sciences of Right and Politics—of the words *Sensation*, *Pleasure*, *Pain*, in Metaphysics; of the words *Equality* and *Liberty* in Politics; of the word *Wealth* in Political Economy—and of the many others to which, generally, there has been added only a more extensive signification than that given them by common usage, will discover the sources of incredible deceptions to the mind, and of incredible evils to humanity." (Rosmini, *Introduzione alla Filosofia.*)

Max Müller in his *Science of Thought*, 1887, (p. 18) says:......" That every one of these words is used in different senses by different philosophers, might be tolerated, if each philosopher would tell us clearly, and once for all, in what sense he himself means to use them. This is what few attempt to do; and if they do it, they often seem to imagine that because there are so many words, there must be also so many distinctions. They overburden us with definitions and make confusion worse confounded."

The following, which is much to the purpose is also quoted from the recent work of Max Müller.

"All I maintain is that, not only to a considerable extent, but always and altogether, we think by means of names, and that things are no more to us than what we mean by their names. What we really mean by names must be settled by definition, and according as our knowledge changes, the definition and therefore the meaning of names will change. Every new addition to our experience may be said to change, to correct, or to complete the intension and the extension of our names, but before we can use our new knowledge, it must always have been embodied either in an old or a new name...... There may be little or much, there may be false or true knowledge in our names, but without some sort of name we cannot reason." (p. 35, *Science of Thought*.)

8. As a means to the desired end, students of medicine should be thoroughly drilled in the use of words of precision, whose employment is coupled with exact knowledge,—not forgetting the fact that to *name is to know*, for these two words have been traced to the same root whose antiquity is almost as great as that of man—, and exact medical knowledge, methodically arranged, will inevitably lead to its practical application in the cure of disease or the alleviation of human suffering. High as is the achievement of curing disease or of alleviating suffering, the physician should aspire to the still higher object of preserving the health of the people. This should be the end of medicine.

PRINCIPLES

OF

NOMENCLATURE AND CLASSIFICATION.

SECTION I.

Preliminary Considerations.

Outline of the anatomical view of man. Definition of medicine. A classification of the science and art of medicine. Medicine and Surgery. Arrangement of medicine into certain departments in accordance with the apparatuses of the human body. The physician. Definition of disease. A synopsis of the morbid states and morbific processes of the body. The value and significance of proper anatomical terms in classification. Definition of system, organ, apparatus, and function. Systems and organs perform no function, but yield service to apparatuses. Each apparatus performs only one function, and there is no function without an apparatus.

THE HUMAN BODY.

Anatomically considered man's body is a grand complex apparatus destined to perform the one function of reproduction of its species. To that end the male and female must couple. The sperm of the male then fecundates the ovum which is within the female, and SHE completes the function of reproduction of the species.

This primary human apparatus is an assemblage of secondary apparatuses that are intended to perform certain special functions, some of which are designed to conserve the individual, and others to keep the body in a healthy condition and fit it for the performance of its one great function.

The senses of man, each of which being the function of a special apparatus, are all subservient to the genetic sense, to the one paramount function, requiring the union of the sexes for its accomplishment.

Such are the facts that may be gleaned from anatomy, but archaeology too teaches its lesson. It appears that many of the ancient nations made the external genital organs of both sexes objects of worship, so much importance did they attach to generation, and that traces of phallic worship have been discovered within a comparatively recent period, even among the savage tribes of the South Sea Islands, and of North, Central, and South America.

Anatomy and archaeology having spoken their word, if a glance be now cast at chapter I, verse 28, of the Book of Genesis, it will be seen that, for a long series of centuries, civilized man has entertained the belief that the object of his existence is to multiply his species. The first command to man was "Increase and multiply and fill the earth." That was to be the one function of man. The other commands, to subdue the earth and rule over all living creatures, are subordinate to the first command, to the one function. Man was to subdue the earth to the end of fulfilling that first command, and he was to rule over all living creatures and make such use of them as might be subservient to that first command. The general disobedience of that command would entail disease, death and the speedy extinction of the species.

All organic nature is busy with the multiplication of species. In the lowest forms of animal and vegetable life this multiplication continues until by some accident the process is interrupted. Such an interruption is one of the checks to the inordinate increase of the species; but when the process ceases, extinction is the inevitable outcome.

Man alone is prone to violate the great law of creation which impels organized beings to reproduce their kind. In these days there are too many unfortunates who, desirous to sin without conceiving, adopt the most injurious means to effect their purpose. Among these may be mentioned the iniquity of Onan, so common among the higher classes, so demoralising and so hurtful to both the male and female.

Most persons are conscious that many of their diseases are caused by their own vices and excesses, the consequences of which are certain to assail and perhaps to destroy them. Often blinded however by their passions, or heedless of nature's inexorable laws they fail to perceive the cause of a particular malady until it is almost if not altogether too late for its removal. Then perhaps they have reluctant recourse to the physician.

DEFINITION AND OBJECTS OF MEDICINE.

It often happens that certain patients long hesitate to consult the true physician, who prescribes for disease and not for symptoms, because of their vague notions of the character and scope of rational medicine—so much derided by cynics and charlatans—and of their idea that the practiser of medicine gropes in the dark in his search for the nature of diseases and for the means of their cure, and that his diagnosis is conjectural while his treatment is empirical. To a man of this class the title of Doctor in medicine is a misnomer, because the "Doctors" whom he knows are neither learned nor wise. He had never been able to make the distinction between the ignorant pretender and the conscientious and well qualified physician. He is at length brought face to face with a Doctor whose mental qualities give him a right to the title. After a short conference he propounds the old question so often asked by the laity, "what is meant by medicine, and can it be ranked as a science"? The answer to this question involves a definition of a science and of an art. If knowledge, acquired by study, experiment, and observation, methodically arranged to serve as a basis upon which are established general and particular principles for guidance in the practice of an art, be accepted as one of the definitions of a science, and if an art can be defined as skill acquired in the use of means for the accomplishment of an end, then medicine is entitled to be ranked as a science and an art. These definitions may be thus condensed; science is to know, and art is to do. This is the answer to the second part of the question. The first part will be answered by a definition of medicine and by a concise statement of its aims and of the methods employed in its study.

Medicine,* as related to man, may be defined

* Medicine, from *mederi*, to heal.

as the science of man in his abnormal states, and the art of curing or of alleviating disease.

Medicine presupposes the science of man in his normal state, and implies the arts of preserving health, of preventing disease, and of prolonging life.

Medicine and its fundamental science and associated arts lay under contribution botany, zoölogy, mineralogy, chemistry, pharmacology, physics, mathematics, and mechanics; assist in the execution of the law of the land, particularly in the special department known as Medical Jurisprudence; aid the State in the prevention of disease, through the department of State Medicine; and have their influence upon the morals of the people. The system of medical morals written by the Father of scientific medicine more than two thousand years ago, is so sound in its broad principles as to have required no changes except in a few details, and the additions that have been made thereto only serve to enforce these principles. The best modern ethical essays are founded upon the Hippocratic oath which was itself erected upon the imperishable foundation of reason, truth, justice, and beneficence. There can be only one medicine, the medicine which, together with its fundamental science and associated arts, is ever seeking the truth, and whose objects are to prevent, heal, or alleviate disease, to preserve health, and to prolong life.

True medicine, founded as it is upon biology, is not fettered by dogmata and is therefore always advancing. The student of medicine must understand the laws of life, and be acquainted with the science of man in his normal condition, and very particularly with the functions of the apparatuses of his body. Until then he is unfit to study, and still more unfit to cope with disease. This leads to what is believed to be a proper classification of medicine.

CLASSIFICATION OF MEDICINE.

Medicine comprises: (A,) the science; and (B,) the art of medicine.

A. THE SCIENCE of medicine and its fundamental science of man in a normal state consist: (I,) of anthropophysiography, or the description of man in a state of health; and (II,) of anthroponosography, or the description of man in a state of disease.

I. ANTHROPOPHYSIOGRAPHY comprises all the branches of anatomy and is the same as human biology.

Anatomy is divided into: (1,) transcendental anatomy; (2,) homological anatomy; (3,) physiognomical anatomy; (4,) embryology; (5,) descriptive anatomy; (6,) comparative anatomy; (7,) topographical anatomy; (8,) histology; (9,) stoechiology; (10,) human physiology; and (11,) comparative physiology.*

1. Transcendental anatomy is the study: (1,) of the general design of the body; and (2,) of the particular design of the organs.

2. Homological anatomy is the study of the correlations of the several parts of the body—(1,) of the organs and their parts; (2,) of the tissues; and (3,) of the apparatuses of the body.

3. Physiognomical anatomy is the study of expressions depicted upon the exterior of the body, more particularly upon the face, such as expressions of joy, despondency, mental anxiety, pain, fear, anger, etc.; and is also the study of those expressions induced by disease.†

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* These branches of anatomy are not ordinarily studied in the order in which they appear above, but the arrangement adopted is in correspondence with the general plan of this work.

† The facies of disease were very long ago carefully studied. Hippocrates described so graphically the expression often induced by the exhaustion incidental to certain chronic and acute diseases, and by long fasting, that this expression bears

4. Embryology is the study: (1,) of the fecundation of the ovum; (2,) of the growth of the embryo; and (3,) of the development of the organs.

5. Descriptive anatomy is the study: (1,) of the general configuration of the body and of the particular configuration of its several parts; (2,) of the gross appearances of the organs; (3,) of the construction of the organs; (4,) of the form, size, color, consistency and weight of the organs; and (5,) of the composition of the apparatuses.

6. Comparative anatomy is the study and comparison of the body and organs of man with those of the lower animals. Its object is to ascertain the nature of the modifications of structure adapted to the needs of different animals.

7. Topographical anatomy is the study of the situations and relations of the several parts and organs of the body.

8. Histology is the study: (1,) of the minute structure of the tissues; and (2,) of the minute structure of the organs.

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the name of *facies Hippocratica*. There are too the facies of cancer, of tuberculosis, of cholera, of hysteria, of epilepsy, etc. The facial expressions varying also according to the seat of particular diseases.

9. *Stoechiology* * is the study of the chemical elements of the gases, fluids, and solids of the body.

10. Human physiology is the study: (1,) of the uses of the organs; and (2,) of the functions of the apparatuses of the body of man.

11. Comparative physiology is the study and comparison of the uses of the organs and of the functions of the apparatuses of all organized beings.

II. ANTROPONOSOGRAPHY, which should be based upon all the branches of anatomy, consists of the two divisions: (1,) teratology; and (2,) pathology.

1. Teratology is the study of the congenital anomalies of the whole or of parts of the body.

2. *Pathology* is the study: (1,) of general diseases; (2,) of diseases of particular organs; (3,) of diseases consequent upon parasitic invasion of the human organism; (4,) of the consequences of the introduction of foreign substances into the body; (5,) of the effects of injuries; (6,) of the consequences of the ingestion of poisons; and (7,) of functional disorders of the apparatuses.

* Stoechiology—from στοιχειον, an element—is ordinarily taught under the names of physiological chemistry and organic chemistry.

The means employed in the study of disease consist in making proper use; (1,) of aetiology; (2,) of symptomatology; (3,) of semeiology; (4,) of pathoanatomy; (5,) of pathohistology; (6,) of nosonomy; (7,) of nosotaxy; (8,) of diagnosis; and (9,) of prognosis.

B. THE ART of medicine and its associated arts consist: (1,) of hygiene, or the art of preserving health; (2,) of prophylaxy, or the art of preventing disease; (3,) of therapy, or the art of curing or of alleviating disease; and (4,) of biothalmy, or the art of prolonging life.

I. HYGIENE,* or the art of preserving health— The preservation of health is generally effected by the strict observance of the rules which relate to the maintenance, in their normal state, of the functions of the body and which are directed principally: (1,) to alimentation; (2,) to exercise; (3,) to clothing; (4,) to sleep; (5,) to ablution; (6,) to residence; (7,) to ventilation; (8,) to light; (9,) to temperature; etc.

II. PROPHYLAXY,† or the art of preventing disease.—Disease may be prevented: (1,) by avoidance of contagion; (2,) by abstention from excesses; (3,) by the strict observance of the rules

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* Hygiene, from *ὑγίειᾰ*, health.

† Prophylaxy, from *προ*, beforehand, and *φυλάττειν*, to guard.

of hygiene; (4,) by the use of medicinal substances having propylactic properties; (5,) by the selection of a suitable climate; (6,) by disinfection; (7,) by proper house drainage; (8,) by the isolation of cases of contagions disease.

III. THERAPY,* or the art of curing or of alleviating disease.—It should be borne in mind that many diseases are cured by unassisted nature, nevertheless they require the closest observation of the medical attendant. Meddlesome physic in such circumstances is often productive of much evil. Here then is a field for the exercise of good judgment on the part of the wise physician who knows when to apply and when to abstain from applying remedies. Here too is the opportunity for the charlatan to make the most of his spurious wares, and to boast of "great cures" which he never effected. However, in ordinary circumstances of disease, nature needs assistance and this assistance should be intelligent, prompt, and efficient. Such assistance may be directed: (1,) to a general disease; (2,) to a special disease of a particular organ; (3,) to an injury; etc. The internal use of medicaments, external applications, mechanical appliances, or the surgeon's ministrations, may be

* Therapy, from θεραπεὐειν, to cure.

needed. From these resources, for the cure or alleviation of disease, it is the office of the physician to select that which is suited to individual cases.

IV. BIOTHALMY,* or the art of prolonging life.—Man's life may be prolonged beyond its ordinary duration, if he be free from disease, (1,) by great sobriety and moderation in all his acts; (2,) by the close observance of the rules of hygiene; (3,) by avoidance of exposure during inclement weather; and (4,) by his leading a serene existence, free from the cares of ordinary life, but with pleasant pursuits.† When man is affected with incurable disease, his life may be prolonged:

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* Biothalmy, from *Βιοθαλμιος*, long-lived. Macrobiosis is also used to express the idea of longevity.

† On this important subject of the prolongation of man's life, the reader may, with advantage, consult "The Code of Health and Longevity," by Sir John Sinclair, Edinburgh, 1807. This very interesting and valuable compilation, in four octavo volumes, contains: rules for preserving health and promoting longevity; regulations for the health of the community; an account of the doctrines of Hippocrates concerning health and longevity; also accounts of Galen; of the minor Greek authors; and of the Arabian and Jewish authors who have written on the subject of health; and of Cicero and Seneca on old age and the shortness of life. It also contains the "*Regimen Sanitatis Salerni*," with Doctor Holland's translation thereof; an account of Lewis Cornaro, a Venitian gentle-

(1,) by a proper dietary; (2,) by suitable medicaments; (3,) by the maintenance of certain functions, as far as practicable, in their normal state; (4,) by rest or exercise as needed, and attention to the conditions of the physical surroundings; (5,) by mechanical appliances; and (6,) by a surgical operation, if such be required.

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man who lived a "sober life" and died aged upward of one hundred years, of the weighing chair of Sanctorius and of his *Medicina Statica;* and an account of British authors who have written upon health and longevity, from Friar Bacon who died in the year 1292, to Doctor Waterhouse in 1805. Among the many accounts of centenarians given in this work, are those of John Rovin in his one hundred and seventy-second (172) year, and of his wife Sarah in her one hundred and sixty-fourth (164) year, and of Petratsch Zortan in the one hundred and eighty-fifth (185) year of his age, with engravings of their portraits which had belonged to the Percys, Earl of Northumberland.

An essay by J. P. M. Flourens, bearing the following title, may also be profitably consulted: "*De la longévité humaine et de la quantité de vie sur le globe.*" Paris, 1856.

A very interesting paper on "the habits and family history of centenarians" by Professor Humphry appeared in the "Popular Science Monthly" for March 1887. This paper had formed a part of a report on the subject by Professor Humphry to the British Medical Association. It contains an analysis of the table of centenarians, by A. Francis, M. R. C. S., of Kings College, Cambridge, which is well worthy of careful perusal.

MEDICINE AND SURGERY.

Medicine has been separated into two departments: (1,) Medicine proper, or, as the French still call it, internal pathology; and (2,) Surgery, or external pathology.* Neither designation is

* For many centuries medicine was in the hands of the priesthood. In Egypt, for instance, none but the priests were permitted to minister to the sick; among the early Israelites, the Prophets, Priests and Levites were the only physicians; and the Priests of Apollo and of Esculapius were, for a long time, the only medical advisers of the Greek people. This most ancient custom, of combining the offices of physician and priest, was adopted by the Christian clergy and prevailed, with few interruptions, until the middle of the eighteenth century.

The school of Salernum owed its celebrity, from the eighth to the twelveth century, to the many learned members of the clergy who there taught or were taught medicine. Among these illustrious men may be mentioned; Theodore, Archbishop of Canterbury; Wigart, Bishop of Hildesheim; Cuthbert, the English monk; the monk Campo; Hughes, Abbot of Saint Denis; John of Ravenna; and Gerbert, afterwards Pope Sylvester II. They had all learned the medicine of the Arabs.

During the eleventh century the Benedictine monks of Monte Cassino greatly distinguished themselves at the Salernum school, and Didier, the Abbot of Monte Cassino, who became Pope Victor III, was one of the teachers in that renowned school.

In the twelveth century priests were forbidden to practise rational, for "medicine proper" has to deal as much with external as with internal diseases, and surgery has as much to do with internal as with external diseases. The physician uses his hands in diagnosis and in ministering to the sufferings of his patients as much as does the surgeon. The word "surgery," meaning simply the art of healing by the use of the hands, does not necessarily imply how the hands shall be used. It does not mean that the hand must needs contain a cautery or a knife any more than a blister or a poultice, or that the hands shall reduce a hernia

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surgery, that is to say to use the knife and shed human blood or to use the actual cautery, and even to study medicine. But during the crusades, and when leprosy was imported into Western Europe, the lepers' hospitals were attended entirely by monks.

There came another prohibition, in the latter part of the thirteenth century, under the pontificate of Boniface VIII.

The law of celibary imposed, in France, upon physicians, was abrogated, in 1452, through the influence of Cardinal d'Etouteville. This should have placed medicine entirely in the hands of the laity. It did not however; for the clergy continued to practise medicine.

The final decree prohibiting priests from practising medicine or surgery was promulgated in the middle of the eighteenth century during the pontificate of Benedict XIV. (Diocesan decrees, Book XIII, chapter X.)

Medicine and surgery were not made absolutely distinct branches until the fourteenth century.

rather than percuss a chest or administer a potion. The term "medicine" was applied to the healing of wounds long before internal diseases were understood.

The term chirurgery, relating to manual operations, was, according to Celsus, not used until the time of Herophilus (307 B. C.). A few centuries ago the word surgeon was employed to designate the "barber-surgeon" in contradistinction from the educated healer who was styled "Master in chirurgery."

In France, as early as the beginning of the fourteenth century, no barber-surgeon was permitted to exercise his calling until he had been examined by certain Masters in chirurgery.*

It would seem preferable to use the word medicine as a generic term and to arrange the science and art of medicine into certain departments in accordance with the several apparatuses of the body such, for instance, as relate; (I,) to affections of the cephalo-rhachidian apparatus and of its subsidiary apparatuses; (II,) to affections of

* "Rule in favor of the Masters in chirurgery of the month of August 1301," contained in Girodat's presentation of the case of the surgeons of Paris under the title of "*Recherches Critiques et Historiques sur l'Origine, sur les Divers Etats, et sur les Progrès de la Chirurgie en France*," Paris 1744, p. 435.

the nutritive apparatus and of its subsidiary apparatuses; (III,) to affections of the motory apparatus; (IV,) to affections of the cutaneous apparatus; and (V,) to affections of the generative apparatus which united to the urinary apparatus constitutes the uro-genital apparatus.

General affections, involving several apparatuses, should also be arranged into proper groups.

THE PHYSICIAN.

The ancient Greeks called the physician *ἰάτρος*, the healer. The ideal physician should however be more than a mere healer of wounds or a prescriber of pills and potions.—Handicraft and shrewdness are his lowest attributes.—He should, in a broad sense of the word, be a philanthropist (implying not only a *lover* but a *knower* of man), and a close, thoughtful, observer of the nature of the human apparatuses, the disorders of whose functions he has to interpret. He should investigate questions relating to the structural and other characters of diseases. He should devise means for the cure of diseases, and formulate rules for their prevention. He should be both *iatrosophista* and *iatrotechna*, learned in the science and skilled in the art of medicine.

In this connection it will be proper to answer the commonly asked question; "What is meant by disease?"

Disease is a deviation from the normal state of the whole or of any part of the body.

The term disease* was long ago introduced into medical language to express the idea of bodily uneasiness or distress such as may be caused by an injury; by an interruption, or a disturbance of vital functions; or by an alteration in the structure of an organ or of several organs of an apparatus or of all the apparatuses of the body. Hence it is that diseases have been classed into functional and organic diseases.† But disease of an organ always disorders, in a greater

* The etymology of the word disease though having little scientific value, is not without interest. This word is derived from *dis*, without, and *ease*, through the old French *désaise*, lack of ease, uneasiness, distress.

† In a written communication on this subject, Professor Meredith Clymer of New York uses the following language: "There can be no change in the accustomed expression of an activity—either by increase, diminution or perversion—without coincident change in the plasmode. Hence strictly there can be no such thing as a functional as distinguished from a structural disease. Disease is always material, whether recognisable as such or not."

or less degree, the function of the apparatus to which it belongs, and sometimes disorders the functions of several apparatuses. Therefore such a classification is faulty and misleading.

The affections of the human body may be:

(1.) Congenital, resulting from vices of the primary conformation;

(2.) Hereditary, transmitted by progenitors;

(3.) Primary, arising from more or less well known causes;

(4.) Secondary, consequent upon preexisting disease—in this case the word pathengenetic * expresses briefly the idea of a disease springing from another disease;

(5.) Traumatic, resulting from injuries; or

(6.) May be the outcome of errors of diet, of the effects of climate, of parasitic invasion, and of gaseous, mineral, vegetable, or animal poisons, including ptomaines and leucomaines.

Although these affections number many species, the morbid states and morbific processes from which these species originate are comparatively few and are comprised under the following captions: (1,) alterations in the composition of the blood; (2,) disturbances in the circulatory

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* The word pathengenetic was lately coined by Dr. Alfred L. Carroll.

apparatus; (3,) pathengenetic alterations of structure; (4,) retrograde metamorphoses; (5,) new growths; (6,) granulation-growths; (7,) cysts; (8,) stones; (9,) injuries; (10,) monsters; (11,) extraneous bodies; (12,) parasites; (13,) poisons; (14,) functional disorders.

SYNOPSIS OF THE MORBID STATES AND MORBIFIC PROCESSES OF THE BODY, BEING A SUGGESTION OF A GROUND WORK FOR THE CLASSIFICATION OF DISEASES.

I. Alterationes in quantitate, in qualitate, et in compositione sanguinis, (Alterations in the quantity, quality, and composition of the blood).

1. Hyperaemia, (Superabundance of blood).
2. Hypoaemia, (Insufficiency of blood).
3. Hyperhydraemia, (Increase of blood-water).
4. Hypohydraemia, (Decrease of blood-water).
5. Hyperinosaemia, (Increase of blood-fibrin).
6. Hypoinosaemia, (Decrease of blood-fibrin).
7. Hyperleucontaemia,* (Increase of blood-albumen).
8. Hypoleucontaemia, (Decrease of blood-albumen).
9. Hyperalonaemia, (Increase of blood-salts).
10. Hypoalonaemia, (Decrease of blood-salts.)
11. Hyperchromataemia, (Increase of blood-color).

* λευκόν, the white of an egg—*albumen.*

12. Hypochromataemia, (Decrease of blood-color).
13. Hyperleucocythaemia, (Increase of white blood-cells).
14. Hypoleucocythaemia, (Decrease of white blood-cells).
15. Hypererythrocythaemia, (Increase of red blood-cells).
16. Hypoerythrocythaemia, (Decrease of red blood-cells).
17. Hyperlipaemia, (Increase of blood-fat).
18. Hypolipaemia, (Decrease of blood-fat).
19. Hyperphysaemia, (Increase of blood-gas).
20. Hypophysaemia, (Decrease of blood-gas).
21. Hyperglycaemia, (Increase of blood-sugar).
22. Hypoglycaemia, (Decrease of blood-sugar).
23. Acetonaemia, (Acetone in the blood).
24. Ammoniaemia, (Ammonia in the blood).
25. Hyperuraemia, (Increase of blood-urea).
26. Hypouraemia, (Decrease of blood-urea).
27. Hyperuricaemia, (Increase of blood-uric acid).
28. Hypouricaemia, (Decrease of blood-uric acid).
29. Cholaemia, (Bile in the blood).
30. Hypercholesteraemia, (Increase of blood-cholesterin).
31. Hypocholesteraemia, (Decrease of blood-cholesterin).
32. Melanaemia, (Black pigment in the blood).
33. Septicaemia, (Putrid infection of the blood).
34. Pyosapraemia, (Putrid-pus infection of the blood).

XIII. Venena, (Poisons,) including all kinds of gaseous, mineral, vegetable, and animal poisons.

XIV. Vitia functionum, (Disorders of the functions.

1. Perversio, (Perversion).
2. Deficiens, (Deficiency).
3. Immoderatio, (Excess).
4. Diminutio, (Diminution).
5. Suspensio, (Suspension).
6. Abolitio, (Abolition).

COMMENTS ON SOME OF THE TERMS USED IN THE SYNOPSIS OF MORBID STATES AND MORBIFIC PROCESSES.

The names given to the morbid states and morbific processes of the body should be changed whenever the true nature of these states and processes is discovered. Many of the names only convey an erroneous idea of the condition which they are intended to express.

The term inflammation, for instance, is used under protest until a better term shall be agreed upon by the profession. The coinage of this word is based upon symptoms and not upon morbid properties. When the exact pathic condition of this so called inflammatory process is clearly defined, the proper name will be found, and when this is found, words will probably be coined in place of those ending in *itis* to denote inflammation of particular parts of the body.

Auxesis * is placed under the caption alterations of structure because increase in bulk of an organ may and does occur independently of what is called inflammation. This word is substituted for hypertrophy which ordinarily is improperly used in the sense of augmentation. Hypertrophy neither means nor does it even imply enlargement. It signifies over-nourishment, the opposite of no nourishment or atrophy. When the body is over-fed, the organs do not of necessity enlarge, but much of the surplus nourishment is deposited, in the form of fat, under the skin, in the mesentery, and around the kidneys; this is an example of true hypertrophy. The organs of the human body receive nourishment to the ex-

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* Auxesis, from αὔξησις, increase, augmentation enlargement.

tent of their requirements, neither more nor less whatever may be their condition. When, from disease, an organ slowly increases in size and afterwards does not tend to decrease, the calibre and length of its nutrient arteries are often found to be increased and the thickness of the walls of these vessels is also proportinately augmented. This condition of the blood vessels is not ordinarily called hypertrophy. It is assuredly a great inconsistency to apply the term hypertrophy to an enlarged organ and not to its enlarged arteries. The careful study of the morbid anatomy of enlarged organs shows that the auxesis has a cause entirely foreign to overnourishment. The disturbing element may or may not be carried to it by the blood, and when it is so carried, the enlargement is due to this disturbing element and not to the quantity of blood which is only proportionate to the demand of the organ for its adequate nutrition. A liver enormously enlarged from cancerous disease is not generally called hypertrophied, and yet it may receive one third more blood than when it was in a normal condition. A large fatty liver is called a fatty and not a hypertrophied liver. The well developed muscles of the athlete are not overnourished. If they were, he would probably be unfit to perform his feats of strength and agility.

The enlarged heart is not over-nourished; it is as likely to be inadequately fed.

The only other instance of hypertrophy is that which occurs in the beginning of certain varieties of local inflammation when, for a short period, the parts are over-fed owing to an undue activity in the circulation. This may soon be followed by stasis of blood in the capillaries. During the static period there is hypotrophy—diminished nutrition, under-feeding—, and if the stasis persist, nutrition ceases. Here then is true atrophy. The part that is no longer nourished dies. This is what is commonly called mortification which is regarded as an unfavorable termination of the inflammatory process. Marasmus, and the emaciation which occurs in phthisis pulmonalis or in the course of febrile disorders, such as typhus and typhoid fevers; in the course of cancerous affections; in chronic pyelo-nephritis; and in saccharine diabetes, exemplify hypotrophy. An organ which has decreased in size may be called meiomous.*

Hypertrophy and atrophy are correctly coined, and good words in their proper places. It is only their misuse that is here criticised.

The words hypertrophy and atrophy of the

* Meiomous, from μείωμα, a decrease.

kidneys which are employed in the English nomenclature of diseases in the year 1869 are rejected in the revision of 1885. The hypertrophy referred to was presumably applied in 1869 to the form of disease now called in the revised edition of 1885 "large white kidney of nephritis" which is a condition of auxesis or enlargement. In like manner atrophy was employed in 1869, but to express the opposite condition now known, and classified in the revised edition, as contracted kidney, which is a decreased or meiomous kidney, a retrograde metamorphosis. It seems clear in both these instances that the word hypertrophy and atrophy, used in 1869 in the case of the kidney, failed to convey an adequate idea, in the minds of the revisers, of the pathic conditions in question, or else, in the revision of 1885, they would not have been abandoned.

If therefore this interpretation of the omission be correct, why should it not be applied to all cases where the word hyphertrophy is used in the sense of increase in bulk, and atrophy in the sense of diminution?

Auxetic affections may be echmatic as in certain types of enlargement of the prostrate, or may *not* be echmatic as in uniform enlargement of the prostate which does not impede the flow of urine. Some auxetic affections are neoplastic, others are pathengenetic.

The words hypertrophy and atrophy will not be employed in this work except when in their true meaning, they are absolutely required.

Stenosis * is generally the outcome of inflammatory action. Stenotic affections are pathic conditions of the excretory ducts and of hollow viscera by which these ducts are narrowed and the viscera lessened in capacity, as in the case of stenosis or stricture of the urethra or in the case of a permanently contracted bladder with markedly diminished capacity. A stenotic affection may or may not be echmatic. It is often echmatic in stricture of the urethra, but not in stenosis of the bladder. Stenotic affections are sometimes congenital, sometimes traumatic, but most frequently they are pathengenetic,† that is to say are the sequelae, the offspring of, or are engendered by a preexisting morbid condition, as for instance, the strictures which result from urethritis, or the stenosis of the bladder springing from inflammation of that viscus.

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* Stenosis, from *στενόω*, to make narrow, to contract.

† Pathengenetic, from *παθος*, a disease, and *εγγενης*, sprung from. (Carroll.)

Ectasis * is a condition of expansion or dilatation of certain serous cavities, hollow viscera, excretory ducts, and lymphatic and blood vessels. Stenotic affections are pathengenetic, and due to inflammatory action, or to obstruction from disease or from the lodgment of a foreign body. Morbid dilation of the bladder, general or local, is an ectatic affection. A so called hydrocele of the tunica vaginalis gives rise to ectasis of the tunica vaginalis.

Echmasis † may result from inflammation, from a neoplasm, or from the lodgment of a foreign body. Echmasis is here used in preference to epischesis of which Vogel makes a class and Cullen an order. Epischesis, from επεχειν, to hold up, to check, to restrain, is defined as a suppression of excretions. Echmasis defines more exactly the character and the cause of the suppression of the excretion, as in the case of retention of urine in the bladder, which generally has for its cause a material obstruction in the urinary passage, such as stricture of the urethra or enlargement of the prostrate. Echmatic affections may therefore be also stenotic or auxetic, and

* Ectasis, from εκ, out, and τεινειν, to stretch, expand, or extend.

† Echmasis, from ἔχμα, obstruction, obstacle, hinderance.

they may be pathengenetic, that is to say may spring from or be engendered by a preexisting pathic condition.

*Blastoma** should be substituted for granuloma which is a hybrid word meaning, according to Dunglison, "a morbid product formed by partition and multiplication of the connective tissue cells into groups of others resembling lymph cells, lying in an intercellular substance, with a tendency to fatty degeneration; as elephantiasis (*Graecorum*), lupus, etc." The same author defines a granule as "a small grain, a compact particle, a cytoblast." The French name for granulation is *bourgeon charnu*, fleshy bud. Blastoma seems to express the meaning intended to be conveyed by granuloma, and something more, for the blastomata are now regarded, by many histologists, as affections caused by the presence of microorganisms, and on this account also the word blastoma is preferable to granuloma which, besides being an ill-formed word, fails to convey the idea of a germ disease.

The term disorder† is applied to functional affections, e. g., disorder of a function, or functional disorder. An organ is said to be diseased,

* Blastoma, from *βλαστός*, shoot, bud, germ, and *ωμα*.

† Disorder, from *dis* without, and order.

but a function disordered. Functional disorders are caused by disease of one or of more than one organ of an apparatus. It is often difficult and sometimes impossible to ascertain which of the organs of an apparatus is so diseased as to disorder the function of that apparatus.

Of the six genera of functional disorders enumerated in the synopsis of morbid states and morbific processes, only four were formerly recognised. It has seemed proper to add *deficiency* (2), which is exemplified by the lessening of urea in the urine, and *suspension* (5), which is exemplified by anuria, and also by retention of urine.

THE VALUE AND SIGNIFICANCE OF PROPER ANATOMICAL TERMS IN CLASSIFICATION.

Certain explanatory comments are now due respecting this proposal for the establishment of a stable basis for the nomenclature and classification of diseases in general and of affections of the uro-genital apparatus of the male in particular.

In accordance with the definition given of the word disease, parasitic affections; congenital abnormities; the lodgment, in the body, of extraneous substances or of poisons; and injuries; may, with propriety, be classed among the diseases of man, for they, also, interrupt or they disturb vital functions. At the same time the word affection may be used as an equivalent term to disease whenever it is found convenient; for, although an affection does not always imply the existence of an organic morbid condition with structural change, all diseases are affections. For instance man may be affected with a congenital malformation, or an injury, as well as with a disease in which there is alteration of structure or impairment of function.

Apparatus is used instead of system for the reasons herein given.

English speaking authors of high reputation have, for a long time past, made use of the phrase genito-urinary *system*, although the word system, in this sense, is so obviously inappropriate. A critical examination of the subject will not fail to convince the inquirer that *system*, in this particular sense has been misapplied if he take the pains to consult the standard medical dictionaries.

The word system,* when used in the anatomical sense, signifies an assemblage of organs composed of the same tissues and intended for similar uses, as for instance the nervous system (system of

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* System, from *σύστημα*, from *συνίστημι* to place together.

nerves), the arterial system, the venous system, the lymphatic system, the muscular system, the osseous system, the ligamentous or desmic system, etc. Systems have general uses, but perform no functions. They are all contained in apparatuses, to which they yield service.

In the nomenclature of diseases prepared by the joint committee appointed by the Royal College of Physicians of London (1869), *system* is throughout used instead of *apparatus* with the exception of the phrase "lacrymal apparatus." The use of the word apparatus in this isolated case would seem to be an inconsistency. The term apparatus being however accepted as the designation of the group of organs by which the tears are secreted and conveyed into the nasal cavity, it is evident that the groups of organs which perform the functions of sight, hearing, smell, taste, respiration, digestion, urination, generation, etc., should be regarded as so many apparatuses.

In the first decennial revision (1885) of this same nomenclature, the word system continues to be used for apparatus, except as before, in the case of the lacrymal apparatus. But in the caption which preceeds, the revisers make use of the term apparatus in a singularly inappropriate sense, i. e. " Disorders of the muscular apparatus" of the eye. The visual, like the other apparatuses of the body, contains parts of several systems; therefore muscular *system* of the eye should have been used instead of muscular *apparatus*, since there is not, in anatomy, any recognition of a muscular apparatus. Again, in this same edition of the London nomenclature, apparatus is used where system should have been applied, e. g., "*Nervorum apparatus morbi.*" The nervous system yields service to the cephalorhachidian and other apparatuses, but there is no *nervous apparatus*. Another example is in the case of "Diseases of circulatory *system*," latinised into "*Sanguinis apparatus morbi.*" The circulatory apparatus comprises a system of arterial, of venous, and of lymphatic vessels, with certain reservoirs, and a pump to carry on the circulation. Therefore there exists neither a blood apparatus nor a circulatory system, but properly a circulatory apparatus. Still another inconsistency may be noticed in the case of "Diseases of the respiratory system, " latinised into "*Spiritus organorum morbi*," and why not here apparatus instead of organs, since the next Latin caption is "*concoctionis apparatus morbi*," which is translated into "Diseases of the digestive *system*"?

These may perhaps be regarded as fair examples of the many defects which seriously mar the modern English system of nomenclature.

An organ,* in anatomical parlance, is a part of the body designed to contribute its share to whatever may be necessary for the completion of a function. An organ may aid in the performance of two or more than two entirely different functions. For instance the urethra, while it transmits the urine is a urinary organ, and while it transmits the semen it is a genital organ; and there is no lack of other equally good examples in human anatomy. Therefore an organ performs no function, being simply one of an assemblage of instruments constituting an apparatus, which alone can perform a function, that is to say bring it to its completion.† "In the organs of a system of organs there is analogy of structure, while in the organs of an apparatus there is analogy only of function." ‡

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* Organ, from *ὀργανον*, an instrument.

† An organ, like a system, yields service to an apparatus in the performance of its function, or to two or more than two apparatuses. Hence it is rightly said that an organ has its *uses*, while an apparatus performs its *one* function.

‡ Dunglison, Littré and Robin, and Dechambre, Duval and Lereboullet.

An apparatus * of the human body is an assemblage of organs which work toward the same end or, in other words, which concur in a common function, though they be of different nature. An apparatus then comprises organs of differing anatomical constitution. An apparatus may be composed of, or may contain, several other apparatuses. For instance, the primary human apparatus consists of five secondary apparatuses which contain sixteen subsidiary apparatuses.

The secondary apparatuses of the body are: (I,) the cephalo-rhachidian apparatus, containing the subsidiary apparatuses,(1,) of vision—including (2,) the lacrymal apparatus—, (3,) of audition, (4,) of olfaction, and (5,) of gustation ; (II,) the nutritive apparatus containing the subsidiary apparatuses, (6,) of mastication, (7,) of deglutition, (8,) of digestion, (9,) of absorption, (10,) of circulation, (11,) of respiration,†—containing (12,) the apparatus of phonation—, (13,) of urination, and (14,) of defecation; (III,) the motory apparatus; (IV,) the cutaneous apparatus, containing (15,)

* Apparatus, from the prefix *ad*, and *parare, paratum,* to prepare.

† The respiratory apparatus contains, but is subsidiary to, the phonetic apparatus which is subsidiary to the cephalo-rhachidian apparatus.

the apparatus of touch,* and (16,) the apparatus of transpiration; † and (V,) the apparatus of generation.

The secondary apparatus of generation and the subsidiary apparatus of urination bear such close anatomical relations to each other that, for clinical purposes, they should be united under the name of the uro-genital apparatus.

Parts of several systems are included in an apparatus as, for instance, nerves, vessels, glands, muscles, bones, cartilages, ligaments, connective tissue, mucous membranes, etc. Each apparatus accomplishes only one function, while each organ of that apparatus may have several uses. There is no apparatus but performs a function, and there is no function without an apparatus (Robin), man himself being a grand primary apparatus destined to perform only one function.‡

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* The tactile apparatus is subsidiary to the cephalo-rhachidian apparatus.

† The transpiratory apparatus is subsidiary to the nutritive apparatus.

‡ Inasmuch as the views above expressed have been characterized as allied to positivism, it is proper that some notice be here taken of this assertion. The subject under consideration is man's body, not his soul; his anatomy, not his psychology. Anatomy, in all its branches, teaches nothing contrary to belief in an Almighty God Creator of all things. A firm believer

The primary apparatus man then, consists of an assemblage of secondary apparatuses; a secondary apparatus consists of an assemblage of subsidiary apparatuses; and a subsidiary apparatus consists of an assemblage of organs and of parts of systems.

A function * is the act accomplished, not by an organ or a system of organs, but by an apparatus which, as already stated, consists of an assemblage of differing organs. Therefore the use of the word function should be restricted to the act of an apparatus.

If the following comparison be allowable, the human apparatus may be likened to a grand orchestra consisting of many differing musical instruments and of men to perform thereon. The function of each performer and his instrument being music. In this case each instrument is passive until it is played upon, when it becomes

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in God, who masters anatomy discovers therein nothing to disturb his creed. Anatomy can deal with only what is finite in man; but with the infinite part of man, that which is God-like, it can have nothing to do, and on this immortal part of man, it can have nothing to say worth hearing, nor is it ever likely to shake the faith that is once well implanted in any mind.

* Function, *functio* from *fungi, functus,* to act, to perform.

a secondary apparatus, and a collection of such secondary apparatuses constitutes the grand orchestra or primary apparatus whose function is *harmonious* music.

Doctor Meredith Clymer defines "a function as the sum of the automatic activities of the organs which go to make up an apparatus, and says; an organ 'yields service to an apparatus,' but it can only do this by being put into act, and that act must be the result of an antonomous, inhering property, a potentiality, set free by a liberating force. The product is an activity or function. An organ can yield no service in a passive state. It must be in an active state, and it cannot *do* or be active without a transformation of potential into kinetic energy by the liberation of energy.* "

Doctor Clymer is known to be a close reasoner and to be convincing by his sound arguments, therefore it is not easy to venture upon anything like opposition to the views he so lucidly puts forth; nevertheless an attempt will be made to find therein a possible flaw.

The "activities" of organs are unquestioned, but if each of these organs be isolated, its activity is insufficient to constitute a function in a

* From a written communication.

physiological point of view. The organ must have the concurrence of other organs, or the function cannot be completed, in other words, the function can be performed only by an assemblage of organs of differing anatomical properties. Each organ contributing its share of activity toward the elaboration and completion of the function. To this assemblage of differing organs, the name of apparatus has been given, and the apparatus performs the function which is the terminal act.

The Doctor's definition of function is excellent and is in harmony with the views contained in this work, but does not precisely agree with what follows, for if the "automatic activities" of certain organs go to make up the function of an apparatus, which is it that performs the function? Is it each organ or every organ? Is it not all the organs together, of the apparatus, rather than each organ separately? If each organ separately, then an assemblage of organs, constituting an apparatus, would perform as many functions as there are in it organs. But the contrary is known to be the case in physiology. For instance, the function digestion is "the sum of the automatic activities" of the organs which constitute the digestive apparatus. The function motion is "the sum of the automatic activities' of the organs which constitute the motory apparatus, etc.

Littré and Robin define the *function* of an apparatus (in anatomy) as the special act which each apparatus executes, and define the *uses* of organs, as the acts executed by each organ. One and the same organ having several uses, while an apparatus performs only one function. "One and the same muscle may aid in the flexion and rotation of a limb. The jaw is used in mastication and in phonation, etc. The word *use* should not be confounded with the word *function* which has an entirely different signification." *

The difficulty arising from the employment of these terms does not lie in the interpretation of the acts themselves, but in language, in the modes of denoting and of differentiating the several acts. It is to be hoped that a suitable word, other than use or function, will be found to express a corect idea of the activity of an organ. The word function however seems well adapted to denote the act of an apparatus. Its use should be so restricted. Therefore, until a better word is suggested, the term function will

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* Dictionnaire de Medicine, de Chirurgie, etc. D'après le plan suivi par Nysten. Douzième édition. Par E. Littré et Ch. Robin, Paris, 1865.

be used, in this work, in connection with the act of an apparatus.

May not the word *faculty* be applied to the activity of an organ, as for example, the glycogenic *faculty* of the liver?

Crabb defines "a faculty as a specific power which is directed to one single object; it is the power of acting according to a given form."

Lewes, in commenting upon faculty and function, says: " . . . By faculty is commonly understood the power or aptitude of an agent to perform a certain action or class of actions. It is thus synonymous with function, which means the activity of an organ, the uses of the instrument. I propose to detatch faculty from this general signification, limiting it to the action or class of actions into which a function may be diversified by the education of experience. That is to say, let function stand for the native endowment of an organ, and faculty for its acquired variation of activity." *

If the word faculty be used to denote the act, the use, the aptitude, of an organ, it should not be detatched from its general signification and should "stand for the native endowment of an

* Problems of Life and Mind. By George Henry Lewes. American edition. Boston, 1879, p. 27.

organ," and function should be restricted to the act of an apparatus.

One of the conclusions drawn from the foregoing considerations is that there is no urinary *system*. The kidneys are the uropoietic organs of the urinary apparatus; they secrete the materials which enter into the composition of the urine; in them the urine is concocted and is then transmitted by their excretory ducts to its proper reservoir. The urinary organs are the kidneys; their excretory ducts, the ureters; and the grand reservoir of the urine, the bladder. These organs, together with the urethra and the prostate, constitute the urinary apparatus. It is by means of this apparatus that the function of elimination, from the body, of certain effete substances, is brought to its completion.

Another conclusion is that there is no genital *system*. The testicles are simply the spermopoietic organs of the genital apparatus. The genital organs are the testicles; the deferential canals; and the seminal vesicles; these organs together with the urethra, the prostate, and the penis, constitute the genital apparatus by which the function of generation is accomplished under proper conditions.

The uro-genital apparatus comprises the urinary apparatus and the genital apparatus.

The organs of the urinary apparatus and those of the genital apparatus are so intimately associated and so interdependent that they must act in perfect harmony or the double apparatus is affected in a greater or less degree. Diseases of any of the urinary organs cause some derangement of the others and disturb the genital organs and often the whole organism.

SECTION II.

Human Nosography.

A summary of the progress of nosography since its foundation. The scope of nosography. Notice of Sauvages. A consense of views necessary in methodical arrangement. Synopses of Sauvages', Cullen's, Parr's, Good's and Delorme's arrangements of diseases. Comments on these several systems, Cullen's rules for distinguishing genera, species, and varieties of diseases. Parr's rules. Some of the aphorisms relating to classification, extracted principally from the philosophia botanica of Linnaeus, by Doctor Thomas Young.

ORIGIN AND PROGRESS OF NOSOGRAPHY.

An outline of the development of nosography may, with advantage, be traced from its foundation to the present time, and be followed by a brief commentary upon the methods employed by some of the nosographers of the last and of this century.

Nosography is in reality the science of medicine and therapy is its art. Nosography includes the description, the definition, the nomenclature, and the classification of diseases. A knowledge of the several branches of anatomy is the essential preliminary to the study of nosography. The physician who is thoroughly acquainted with this science is a master of the natural history of diseases. The training necessary to its acquirement gives him a precision in diagnosis, and a degree of wisdom in prognosis and of skill in therapy, to which otherwise he could never attain.

The word nosography* is of comparatively modern application. It was not in use among the ancient physicians.† Although the study of the history of diseases began with the founder of medical art and was faithfully continued by his successors, no attempt at their classification seems to have been made until about the close of the sixteenth century. Andreo Cesalpino, ‡ the Italian physician and naturalist, was probably the first to suggest the methodical arrangement of

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* Nosography, from *νόσος*, disease, and *γράφειν*, to describe.

† The works of the ancient authors, such as Hippocrates, Galen, Celsus, and others, contain no synopses of classification, but their description of diseases is often very accurate and much of their nomenclature is still in use. Although the Arabian physicians were close followers of the doctrines of Aristotle, nothing that can be called a methodical classification of diseases has been found in their treatises.

‡ Cesalpino was born at Arezzo in the year 1519 and died in 1603.

diseases. This however was not attempted until the beginning of the seventeenth century when, in 1602, Felix Platerus, of Basle, published, in his "*Praxeos Medicae*," the plan of a nosographical method, but went no farther. Among other contributions were, the "*Nosologia*" of Warenius of Leipsic, 1605; the "*Nosologia Harmonica, Dogmatiga, et Hermetica*" of Petraeus of Marburg, 1614; the "*Idea Universalis Medicinae*, of Johnstonus of Amsterdam, published in 1644, with a section devoted to classification, wherein are arranged all diseases into three classes, divided into internal and external diseases; and finally, in 1675, the "*Nosologia*" of Schoenfeld. All these essays were incomplete and of little use except that they were the forerunners of the good work which was subsequently performed. Such was the extent of the progress of nosography, which then stood still for half a century. Sydenham and Baglivius,* who wrote toward the end of the seventeenth century, were of opinion that diseases should be classified, like systems of botany, by genera and species with characteristic definitions. Other physicians of their time were of the same opinion (Cullen). It appears, how-

* Georgii Baglivi, De Praxi Medica, etc., Lugduni Batavorum, 1700.

ever, that this was not attempted until the year 1732, when François Boissier de Sauvages of Montpellier published an essay with the title of "*Nouvelles Classes de Maladies Disposées dans un Ordre semblable à celui des Botanistes.*" From this preliminary essay he built up his "*Nosologia Methodica*" which he did not publish until 1760, after nearly thirty years of diligent labor. Mention should also be made of the nosographical contribution of Hebenstreit of Leipsic, 1754. But Sauvages was really the founder of methodical nosography to which he gave the greatest impulse. He was followed by Linnaeus, Vogel, Cullen, Sagar, Macbride, Vitet, Darwin, Selle, Pinel, Baumes, Tourdes, Tourtelle, Récamier, Crichton, Parr, Swediaur, Young, Richerand, Good, Alibert, Hosack, and others who, in some instances, subtracted from, or added to, without materially changing, his great plan the framework of which they all retained while they made very little change in his nomenclature, much of which is still in use.

Sauvages was a man of brilliant mind and extraordinary industry. He had been prepared for his task of founding the science of nosography by a broad and liberal education. He had studied and taught botany, and his tastes brought him into close relations with the renowned Linnaeus.

He had for counselor the illustrious Boerhaave, from whom he received much encouragement in the prosecution of his difficult and arduous labors. He cheerfully accepted, and profited by, the criticisms of his contemporaries, and lived to complete, but not to see in print, the last revision of his gigantic work which was not published until a year after his death. Sauvages had entered the medical profession at an early age, and had passed a little over one year in Paris where he gathered the material for an essay upon fevers. His first nosographical essay was published in 1732. He then wrote upon inflammation, upon capillary vessels, upon hemiplegia, and upon rabies. He wrote also a physiological conspectus which was published at Lyons in 1751; upon a theory of the circulation of the blood; upon the effects of medicaments; upon embryology; upon tumors; muscular movements; elements of physiology; difficult respiration; vision; a theory of convulsions; methodical pathology; and finally came his *Nosologia Methodica.* This was the crowning work, for afterwards only a few dissertations appeared from his fertile pen, and he died, full of honors, on February 19th, 1767, at the age of sixty-one, after an illness of two years duration.

To exemplify the estimation in which this truly great physician was held, the following is quoted from Good's Physiological system of Nosology 1823.

"The Nosologia Methodica, for such is the title of Mr. de Sauvages' work, is indeed, an Herculean labour. It consists, in its latest and most perfect form, of three distinct arrangements —a symptomatical, an aetiological, and an anatomical; so as to accommodate itself to the taste of the old school as well as of the new. The symptomatical, to which the others are professedly subordinate, is by far the most extensively elucidated; and comprises ten classes, (each introduced by an elaborate pathological synopsis), upwards of forty orders, more than three hundred genera, and an almost innumerable host of species.....We have yet, however, to add the varieties, which under several species are not few; and to bear in mind that to every variety, species and genus, as far as their relative characters will allow, are allotted a definition, list of synonyms, history, diagnosis, prognosis, and mode of cure; with, frequently, an exemplification of cases, and a brief statement of the peculiar opinions of other writers, before we can fairly appreciate the entire mass of matter with which the volumes of Mr. de Sauvages abound. He seems, indeed, to have been desirous of collecting materials of every kind and quality from every quarter to which a market was open; and of following up every deviation from health into all its possible as well as its actual shades and ramifications....."

The followers of Sauvages, from Linnaeus to Hosack were all men of much general and scientific culture. None of these eminent men was better endowed with those requisite qualities than the celebrated Cullen, who in the edition of his works prepared in 1827 by Doctor John Thomson, paraphrases an aphorism of the illustrious Aristotle as follows:

"Perfect division and definition is the summit of human knowledge in every part of science, and requires not only the clearest but the most comprehensive views, such as, with respect to diseases, we can arrive at only by often-repeated exercises and much study."

Cullen further says, "The attempt may at first appear uncouth and difficult, but by repetition it will become more familiar and easy, and you must be content to make such a progress. When a little more than thirty years ago, I first got a sight of the botanical system of Linnaeus, it appeared to me to be a piece of the most uncouth jargon and minute pedantry; but, by length of time, it is now as familiar to me as my mother tongue; and with whatever difficulty it was first received in most parts of Europe, it has now surmounted these, and its utility has reconciled every person to the study of it."

A CONSENSE OF VIEWS NECESSARY IN METHODICAL ARRANGEMENT.

The earliest medical authors realised the importance of arrangement* in the elucidation of their teachings, but formed no concerted plan. The effect of this lack of common agreement was the adoption of many differing methods. Most of these early writers divided their works into parts, books, chapters, and sections. Some of them adopted the synoptic, and others the systematic method. Later the method of the botanists was adopted; and the arrangement of diseases into classes, orders, genera and species, has, ever since, been used by the systematic writers. The systematic method has been variously modified: (1,) by the adoption of an alphabetical arrangement of diseases; (2,) by the arrangement

* "Without arrangement, no art or science can be acquired, for in its absence none can be treated of or communicated." (J. M. Good.)

of diseases, in accordance with their duration, into acute and chronic diseases; (3,) by the arrangement of diseases in accordance with the anatomical regions of the body, such as the head, the trunk, and the extremities; (4,) by the arrangement of diseases in accordance with their aetiology; (5,) by the arrangement of diseases in accordance with the sex and age of the patients; and (6,) by the arrangement of diseases in accordance with their symptoms. The last named arrangement having been suggested by Platerus and first effected by Sauvages.

In order to convey to the mind a correct idea of the arrangement adopted by the nosographers of the past, a synopsis of the classes of the most prominent among them is introduced. But the synopses of Sauvages, Cullen, Parr, Good, and Delorme, are given entire to enable the student to conveniently examine and compare these several systems. Sauvages' system (1732–1767), representing the beginning of the science; Cullen's system (1769–1790), showing the progress made up to his time; Parr's system (1809), exhibiting a marked change, not however for the better, in classification, while the nomenclature is little changed; Good's system (1822), showing a very great improvement in classification though not in nomenclature; and Raige-Delorme's syssytem (1841), being a fair specimen of the decline of nosography in France.

As it may be useful to students of nosography to have before them some of the most ancient terms used in medicine, a part of the nomenclature of Hippocrates is here inserted in order that they may see at a glance those ancient words which are retained in the existing medical nomenclature.

ALPHABETICAL LIST OF DISEASES UPON WHICH HIPPOCRATES HAS WRITTEN, BEING A FAIR EXEMPLIFICATION OF HIS NOMENCLATURE.*

1 Abscesses
2 Achores
3 Alopecia
4 Anasarca
5 Anchylosis
6 Anus, inflamed
7 " hard tubercles of or near the
8 Appetite, canine
9 " , loss of

* From Motherby's Medical Dictionary. Third edition, London. 1791.

10 Aphthae
11 Apolepsis
12 Apoplexy
13 Arms, shortness of the
14 Ascarides
15 Asthma
16 Auante
17 Baldness
18 Barrenness
19 Biles
20 Bladder, tubercles in the
21 Blood, spitting of
22 " , vomiting
23 Blotches, red on the legs, from sitting by the fire
24 Brain, concussion of the
25 " , ruptured vessels in the
26 Breath, fœtid
27 " , straightness of the
28 Buboes
29 Carbuncle
30 Catamenia: disordered, natural
31 Catoche
32 Cancers
33 Carus
34 Cataphora
35 Cachexy
36 Catarrh

37 Caries
38 Cheek, a sphacelous of the
39 Chilblains
40 Cholera morbus
41 Chalk stones in the joints
42 Cough
43 Coryza
44 Coma
45 " vigil
46 Contractions of the fibres
47 Consumption, of the whole body
48 " , ischiadic
49 " , nephritic
50 Colour, bad
51 Crookedness
52 Deafness
53 Delirium
54 Defluxion or rheum
55 Diarrhoea
56 Dreams, frightful
57 Dumbness
58 Dysentery
59 Dyspnoea
60 Dysury
61 Ears, pains in the
62 " , redundant moisture in the
63 " , ringing in the
64 " , tubercles about the

65 Ecchymosis from contusion
66 Empyema
67 Emprosthotonos
68 Epilepsy
69 " , in children
70 Epinyctides
71 Erysipelas
72 Eruption on the skin
73 Evil
74 Eye, distortion of the
75 " , bleared
76 " , dry-bleared
77 " , clouds in the
78 " , cicatrices in the
79 " , pearls in the
80 " , white spots in the
81 " , ruptured
82 " , exulcerated
83 " , inflamed
84 " , dry inflammation of the
85 Eye-lids, excressences on the
86 " , tumid outward
87 " , coalesence of the
88 " , scabby
89 " , tumors on the
90 Face, hard tubercles on the
91 Favi
92 Fainting

93 Fevers
94 Fistulas
95 Fractures
96 Freckles
97 Gangrene
98 Glaucoma
99 Green sickness
100 Griping of the intestines
101 Gout
102 Gonorrhoea benigna
103 Gums, black
104 " , pains in the, from teething
105 " , tubercles on the
106 Haemorrhages
107 Haemorrhoids
108 Hearing, dull
109 Heartburn
110 Head, heaviness of the
111 " , ache
112 " , scurvy
113 Herpes
114 Hesitation
115 Hiccough
116 Horror
117 Hoarseness
118 Humors, discharge of morbid
119 Hysterics
120 Hypersarcosis

121 Jaundice
122 Illiac passion
123 Impotence
124 Inflammation: external, internal
125 Itch
126 Itching
127 " , a pungent, in the mouth
128 Kidnies, disorders of the
129 Labour, difficult
130 Leprosy
131 " , the white
132 Lethargy
133 Leucophlegmatia
134 Lientery
135 Lips, fissures in the
136 Limping
137 Liver, inflamed
138 Lochia, disordered
139 Lungs, spasmodically contracted
140 " , varix in the
141 " , suppurated
142 " , crude tubercles in the
143 Luxations
144 Madness
145 Melancholy
146 Mind, alienation of the
147 " , alienation through melancholy
148 Miscarriage

149 Mole
150 Mouth, distorted
151 Nauseating food
152 Navel, inflamed
153 Neck, a hard tumor in the
154 Nose, a discharge of pus in the
155 Nocturnal pollutions
156 Nyctalops
157 Opisthotonos
158 Orthopnea
159 Pain, in the loins
160 Palpitation
161 Peripneumony
162 Phlyctaenae
163 Phrenitis
164 Phrontis
165 Placenta, adhering
166 Plague
167 Pleurisy
168 " , a dry
169 " , a moist
170 Polypus, in the nose
171 Pterygion
172 Pustules, from acrid sweat
173 Pudenda, excressences of the
174 " , putrefaction of the
175 Pupil of the eye, too small or angular
176 " " " " , exulcerated

177 Pupil of the eye, cicatrix of the
178 " " " ", spoiled
179 " " " ", removed from its natural situation
180 " " " ", prominent
181 Quinsey, affecting the lungs
182 Restlessness
183 Rheum, a defluxion of
184 Ruptures
185 Salivation, a spontaneous
186 Sciatica
187 Scurvy
188 Sensation, suddenly lost
189 Shivering
190 Sight, a privation of
191 Skin, desquamations of the
192 Speech, too volatile
193 Spleen, swelled
194 ", inflamed
195 Spine, distorted forwards
196 Sprains
197 Sphacelus
198 Stertor
199 Strangury
200 Stone
201 Stupidity
202 Stammering
203 Superfetation

204 Tabes dorsalis
205 Teeth, stupor of the
206 " , gnashing and grinding of the
207 " , ache
208 " , of both jaws fixed together
209 Tetanus
210 Tetters
211 Testicles, swelled
212 Tenesmus
213 Terminthi
214 Tonsils, disorders of the
215 " , swelled
216 Torpidness of the body
217 Tongue, fissured
218 " , tumor under the
219 Trichosis
220 Tubercles of various sorts
221 Tumors
222 Uvula, relaxed
223 " , retracted
224 " , putrefied
225 Uterus, disorders of the
226 " , falling down of the
227 Ulcers
228 Urine, retained
229 Urethra, caruncles or tubercles in the
230 Voice, loss of the
231 Varices

232 Vertigo
233 Warts
234 Worms
235 Whitlow
236 Wry neck
237 Wounds
238 White flux
339 Yawning

SYNOPSIS OF THE CLASSES, ORDERS, AND GENERA OF SAUVAGES' SYSTEM.

CLASSIS I. VITIA.

ORDO I. MACULAE.

Genus 1. Leucoma.
" 2. Vitiligo.
" 3. Ephelis.
" 4. Gutta rosea.
" 5. Naevus.
" 6. Ecchymoma.

ORDO II. EFFLORESCENTIAE.

Genus 7. Herpes.
" 8. Epinyctis.
" 9. Psydracia.
" 10. Hidroa.

Ordo III. Phymata.

Genus	11.	Erythema.
"	12.	Oedema.
"	13.	Emphysema.
"	14.	Scirrhus.
"	15.	Phlegmone.
"	16.	Bubo.
"	17.	Parotis.
"	18.	Furunculus.
"	19.	Anthrax.
"	20.	Cancer.
"	21.	Paronychia.
"	22.	Phimosis.

Ordo IV. Excrescentiae.

Genus	23.	Sarcoma.
"	24.	Condyloma.
"	25.	Verruca.
"	26.	Pterygium.
"	27.	Hordeolum.
"	28.	Bronchocele.
"	29.	Exostosis.
"	30.	Gibbositas.
"	31.	Lordosis.

Ordo V. Cystides.

Genus	32.	Aneurysma.
"	33.	Varix.

Genus 34. Hydatis.
" 35. Marisca.
" 36. Staphyloma.
" 37. Lupia.
" 38. Hydrarthrus.
" 39. Apostema.
" 40. Exomphalus.
" 41. Oscheocele.

ORDO VI. ECTOPIAE.

Genus 42. Exophthalmia.
" 43. Blepharoptosis.
" 44. Hypostophyle.
" 45. Paraglossa.
" 46. Proptoma.
" 47. Exania.
" 48. Exocyste.
" 49. Hysteroptosis.
" 50. Enterocele.
" 51. Epiplocele.
" 52. Gasterocele.
" 53. Hepatocele.
" 54. Splenocele
" 55. Hysterocele.
" 56. Cystocele.
" 57. Encephalocele.
" 58. Hysteroloxia.
" 59. Parorchydium.

Genus 60. Exarthrema.
" 61. Diastasis.
" 62. Laxarthrus.

Ordo VII. Plagae.

Genus 63. Vulnus.
" 64. Punctura.
" 65. Excoriatio.
" 66. Contusio.
" 67. Fractura.
" 68. Fissura.
" 69. Ruptura.
" 70. Amputatura.
" 71. Ulcus.
" 72. Exulceratio.
" 73. Sinus.
" 74. Fistula.
" 75. Rhagas.
" 76. Eschara.
" 77. Caries.
" 78. Arthrocace.

CLASSIS II. FEBRES.

Ordo I. Continuae.

Genus 79, Ephemera.
" 80. Synocha.
" 81. Synochus.

Genus 82. Typhus.
" 83. Hectica.

ORDO II. REMITTENTES.

Genus 84. Amphimerina.
" 85. Tritaeophya.
" 86. Tetartophya.

ORDO III. INTERMITTENTES.

Genus 87. Quotidiana.
" 88. Tertiana.
" 89. Quartana.
" 90. Erratica.

CLASSIS III. PHLEGMASIAE.

ORDO I. EXANTHEMATICAE.

Geuus 91. Pestis.
" 92. Variola.
" 93. Pemphigus.
" 94. Rubeola.
" 95. Miliaris.
" 96. Purpura.
" 97. Erysipelas.
" 98. Scarlatina.
" 99. Effera.
" 100. Aphtha.

Ordo II. Membranaceae.

Genus 101. Phrenitis.
" 102. Paraphrenesis.
" 103. Pleuritis.
" 104. Gastritis.
" 105. Enteritis.
" 106. Epiploitis.
" 107. Metritis.
" 108. Cystitis.

Ordo III. Parenchymatosae.

Genus 109. Cephalitis.
" 110. Cynanche.
" 111. Carditis.
" 112. Peripneumonia.
" 113. Hepatitis.
" 114. Splenitis.
" 115. Nephritis.

CLASSIS IV. SPASMI.

Ordo I. Tonici Partiales.

Genus 116. Strabismus.
" 117. Trismus.
" 118. Obstipitas.
" 119. Contractura.
" 120. Crampus.
" 121. Priapismus.

Ordo II. Tonci Generales.

Genus 122. Tetanus.
" 123. Catochus.

Ordo III. Clonici Partiales.

Genus 124. Nystagmus.
" 125. Carphologia.
" 126. Pandiculatio.
" 127. Apomyttosis.
" 128. Convulsio.
" 129. Tremor.
" 130. Palpitatio.
" 131. Claudicatio.

Ordo IV. Clonici Generales.

Genus 132. Rigor.
" 133. Eclampsia.
" 134. Epilepsia.
" 135. Hysteria.
" 136. Scelotyrbe.
" 137. Beriberia.

CLASSIS V. ANHELATIONES.

Ordo I. Spasmodicae.

Genus 138. Ephialtes.
" 139. Sternutatio.
" 140. Oscedo.

Genus 141. Singultus.
" 142. Tuffis.

Ordo II. Oppressivae.

Genus 143. Stertor.
" 144. Dyspnoea.
" 145. Asthma.
" 146. Orthopnoea.
" 147. Angina.
" 148. Pleurodyne.
" 149. Rheuma.
" 150. Hydrothorax.
" 151. Empyema.

CLASSIS VI. DEBILITATES.

Ordo I. Dysaesthesiae.

Genus 152. Cataracta.
" 153. Caligo.
" 154. Amblyopia.
" 155. Amaurosis.
" 156. Anosmia.
" 157. Agheustia.
" 158. Dysecoea.
" 159. Paracusis.
" 160. Cophosis.
" 161. Anaesthesia.

ORDO II. ANEPITHYMIAE.

Genus 162. Anorexia.
" 163. Adipsia.
" 164. Anaphrodisia.

ORDO III. DYSCINESIAE.

Genus 165. Mutitas.
" 166. Aphonia.
" 167. Psellismus.
" 168. Paraphonia.
" 169. Paralysis.
" 170. Hemiplegia.
" 171. Paraplegia.

ORDO IV. LEIPOPSYCHIAE.

Genus 172. Asthenia.
" 173. Leipothemia.
" 174. Syncope.
" 175. Asphyxia.

ORDO V. COMATA.

Genus 176. Catalepsis.
" 177. Ecstasis.
" 178. Typhomania.
" 179. Lethargus.
" 180. Cataphora.
" 181. Carus.
" 182. Apoplexia.

CLASSIS VII. DOLORES.

ORDO I. VAGI.

Geuus 183. Arthritis.
" 184. Ostocopus.
" 185. Rheumatismus.
" 186. Catarrhus.
" 187. Anxietas.
" 188. Lassitudo.
" 189. Stupor.
" 190. Pruritus.
" 191. Algor.
" 192. Ardor.

ORDO II. CAPITIS.

Genus 193. Cephalalgia.
" 194. Cephalaea.
" 195. Hemicrania.
" 196. Ophthalmia.
" 197. Otalgia.
" 198. Odontalgia.

ORDO III. PECTORIS.

Genus 199. Dysphagia.
" 200. Pyrosis.
" 201. Cardiogmus.

Ordo IV. Abdominales interni.

Genus 202. Cardialgia.
" 203. Gastrodynia.
" 204. Colica.
" 205. Hepatalgia.
" 206. Splenalgia.
" 207. Nephralgia.
" 208. Dystocia.
" 209. Hysteralgia.

Ordo V. Externi et artuum.

Genus 210. Mastodynia.
" 211. Rhachialgia.
" 212. Lumbago.
" 213. Ischias.
" 214. Proctalgia.
" 215. Pudendagra.

CLASSIS VIII. VESANIAE.

Ordo I. Hallucinationes.

Genus 216. Vertigo.
" 217. Suffusio.
" 218. Diplopia.
" 219. Syrogmos.
" 220. Hypochondriasis.
" 221. Somnambulismus.

Ordo II. Morositates.

Genus	222.	Pica.
"	223.	Bulimia.
"	224.	Polydipsia.
"	225.	Antipathia.
"	226.	Nostalgia.
"	227.	Panophobia.
"	228.	Satyriasis.
"	229.	Nymphomania.
"	230.	Tarantismus.
"	231.	Hydrophobia.

Ordo III. Deliria.

Genus	232.	Paraphrosyne.
"	233.	Amentia.
"	234.	Melancholia.
"	235.	Mania.
"	236.	Demonomania.

Ordo IV. Vesaniae anomalae.

Genus	237.	Amnesia.
"	238.	Agrypnia.

CLASSIS IX. FLUXUS.

Ordo I. Sangninfluxus.

Genus	239.	Haemorrhagia.
"	240.	Haemoptysis.

Genus 241. Stomacace.
" 242. Haematemesis.
" 243. Haematuria.
" 244. Menorrhagia.
" 245. Abortus.

ORDO II. ALVIFLUXUS.

Genus 246. Heptirrhoea.
" 247. Haemorrhois.
" 248. Dysenteria.
" 249. Melaena.
" 250. Nausea.
" 251. Vomitus.
" 252. Ileus.
" 253. Cholera.
" 254. Diarrhoea.
" 255. Caeliaca.
" 256. Lienteria.
" 257. Tenesmus.

ORDO III. SERIFLUXUS.

Genus 258. Ephidrosis.
" 259. Epiphora.
" 260. Coryza.
" 261. Ptyalismus.
" 262. Anacatharsis
" 263. Diabetes.
" 264. Enuresis.

Genus 265. Dysuria.
" 266. Pyuria.
" 267. Leucorrhoea.
" 268. Gonorrhoea.
" 269. Dyspermatismus.
" 270. Galactirrhoea.
" 271. Otorrhoea.

Ordo IV. Acrifluxus.

Genus 272. Flatulenta.
" 273. Aedopsophia.
" 274. Dysodia.

CLASSIS X. CACHEXIAE.

Ordo I. Macies.

Genus 275. Tabes.
" 276. Phthisis.
" 277. Atrophia.
" 278. Aridura.

Ordo II. Intumescentiae.

Genus 279. Polysarcia.
" 280. Pneumatosis.
" 281. Anasarca.
" 282. Phlegmatia.
" 283. Physconia.
" 284. Graviditas.

Ordo III. Hydropes Partiales.

Genus 285. Hydrocephalus.
" 286. Physocephalus.
" 287. Hydrorhachitis.
" 288. Ascites.
" 289. Hydrometra.
" 290. Physometra.
" 291. Tympanites.
" 292. Meteorismus.
" 293. Ischuria.

Ordo IV. Tubera.

Genus 294. Rhachitis.
" 295. Scrophula.
" 296. Carcinoma.
" 297. Leontiasis.
" 298. Malis.
" 299. Framboesia.

Ordo V. Impetigines

Genus 300. Syphilis.
" 301. Scorbutus.
" 302. Elephantiasis.
" 303. Lepra.
" 304. Scabies.
" 305. Tinea.

Ordo VI. Icteritiae.

Genus 306. Aurigo.
" 307. Melasicterus.
" 308. Phaenigmus.
" 309. Chlorosis.

Ordo VII. Cachexiae anomalae.

Genus 310. Phthiriasis.
" 311. Trichoma.
" 312. Alopecia.
" 313. Elcosis.
" 314. Gangraena.
" 315. Necrosis.

In his *nosologia methodica*, Sauvages enumerates ten classes, forty-four orders, three hundred and fifteen genera and many species and varieties.

Many of the orders contain genera that bear no relation with each other. For instance in the third order, *phymata*, of the first class, *vitia*, are included erythema, emphysema, scirrhus, bubo, anthrax, cancer, paronychia and phimosis. In the fourth order *excrescentiae*, are placed sarcoma, condyloma, pterygium, bronchocele, and exostosis. In the fifth order *cystides* are, aneurysm, varix, marisca (piles), staphyloma, hydrarthrus, and oscheocele.

In the second class are arranged the fevers, in three orders, continued, remittent, and intermittent, and twelve genera.

In the first order *exanthematicae*, of the third class, *phlegmasiae*, are placed the plague, small pox, measles, purpura, erysipelas, and aphtha. In the second order *membranaceae*, are phrenitis, pleuritis, gastritis, metritis, and cystitis. In the third order, *parenchymatosae*, are cephalitis, carditis, nephritis, etc.

There are many other defects in this system which now make it of little use, but it should be borne in mind that medicine has greatly advanced since the time of Sauvages, and that his classification is one of the great factors in this advance. He used, to the best advantage, the knowledge and the material which he possessed, and his system made a profound impression on the profession.

Sauvages had an enthusiastic admirer in Linnaeus who, after following the Sauvagian system, for nearly twenty years, in his lectures at Upsala, caused to be published (in 1759), a classification of diseases prepared, under his direction, by one of his disciples. Afterwards he, himself, prepared and published (in 1763), a new classification of diseases very similar to that of Sauvages and consisting of eleven classes: 1, Exanthematici; 2, Critici; 3, Phlogistici; 4, Dolorosi; 5, Mentales; 6, Quietales; 7, Motorii; 8, Suppressorii; 9, Evacuatorii; 10, Deformes; 11, Vitia: thirty-seven orders, and three hundred and twenty-six genera.

In comparing this nosographical table with that of Sauvages, says Pinel, it is easily seen that descriptive medicine had not made great progress under the fertile pen of Linnaeus.

Linnaeus was soon followed by Vogel of Göttingen who, (in 1764), published a classification of diseases consisting of eleven classes: 1, Febres; 2, Profluvia; 3, Epischeses; 4, Dolores; 5, Spasmi; 6, Adynamiae; 7, Hyperaestheses; 8, Cachaexiae; 9, Paranoiae; 10, Vitia; 11, Deformitates, and five hundred and sixty genera.

Vogel introduces three new classes: (3,) Epischeses, (6,) Adynamiae, and (7,) Hyperaestheses; and places phlegmasiae among the vices.

The nosology of Cullen was first published in 1769, and was followed by several revisions. It contains four classes, nineteen orders, one hundred and fifty genera, nearly six hundred species, and many varieties. A synopsis of the classes, orders, and genera, is here introduced for comparison with the preceding systems.

CULLEN'S SYNOPSIS OF CLASSES, ORDERS AND GENERA OF DISEASES. PARTLY FROM THE EDITION OF 1827.

CLASSIS I. PYREXIAE.

ORDO I. FEBRES.

Sectio 1. Intermittentes.

Genus 1. Tertiana.
" 2. Quartana.
" 3. Quotidiana.

Sectio 2. Continuae.

Genus 4. Synocha.
" 5. Typhus.
" 6. Synochus.—Hectica.

ORDO II. PHLEGMASIAE.

Genus 7. Phlogosis—Apostema.
Gangrena—Sphacelus.
" 8. Ophthalmia.
" 9. Phrenitis.
" 10. Cynanche.
" 11. Pneumonia.—Vomica. Empyema.
" 12. Carditis.
" 13. Peritonitis.
" 14. Gastritis.
" 15. Enteritis.
" 16. Hepatitis.

Genus 17. Splenitis.
" 18. Nephritis.
" 19. Cystitis.
" 20. Hysteritis.
" 21. Rheumatismus—Arthrodynia.
" 22. Odontalgia.
" 23. Podagra.
" 24. Arthropuosis.

ORDO III. EXANTHEMATA.

Genus 25. Variola.
" 26. Varicella.
" 27. Rubeola.
" 28. Scarlatina.
" 29. Pestis.
" 30. Erysipelas.
" 31. Miliaria.
" 32. Urticaria.
" 33. Pemphigus.
" 34. Aphtha.

ORDO IV. HAEMORRHAGIAE.

Genus 35. Epistaxis.
" 36. Haemoptisis. Phthisis.
" 37. Haemorrhois.
" 38. Menorrhagia.
" 39. Catarrhus.
" 40. Dysenteria.

CLASSIS II. NEUROSES.

ORDO I. COMATA.

Genus 41. Apoplexia.
" 42. Paralysis.—Tremor.

ORDO II. ADYNAMIAE.

Genus 43. Syncope.
" 44. Dyspepsia.
" 45. Hypochondriasis.
" 46. Chlorosis.

ORDO III. SPASMI.

Genus 47. Tetanus.
" 48. Trismus.
" 49. Convulsio.
" 50. Chorea.
" 51. Raphania.
" 52. Epilepsia.
" 53. Palpitatio.
" 54. Asthma.
" 55. Dyspnoea.
" 56. Pertussis.
" 57. Pyrosis.
" 58. Colica.
" 59. Cholera.
" 60. Diarrhoea.
" 61. Diabetes.

Genus 62. Hysteria.
" 63. Hydrophobia.

ORDO IV. VESANIAE.

Genus 64. Amentia.
" 65. Melancholia.
" 66. Mania.
" 67. Oneirodynia.

CLASSIS III. CACHEXIAE.

ORDO I. MARCORES.

Genus 68. Tabes.
" 69. Atrophia.

ORDO II. INTUMESCENTIAE.

Sectio 1. Adiposae.

Genus 70. Polysarcia.

Sectio 2. Flatuosae.

Genus 71. Pneumatosis.
" 72. Tympanites.
" 73. Physometra.

Sectio 3. Aquosae.

Genus 74. Anasarca.
" 75. Hydrocephalus.
" 76. Hydrorachitis.

Genus 77. Hydrothorax.
" 78. Ascites.
" 79. Hydrometra.
" 80. Hydrocele.

Seetio 4. Solidae.

Genus 81. Physconia.
" 82. Rachitis.

ORDO III. IMPETIGINES.

Genus 83. Scrophula.
" 84. Syphilis.
" 85. Scorbutus.
" 86. Elephantiasis.
" 87. Lepra.
" 88. Frambesia.
" 89. Trichoma.
" 90. Icterus.

CLASSIS IV. LOCALES.

ORDO I. DYSAESTHESIAE.

Geuus 91. Caligo.
" 92. Amaurosis.
" 93. Dysopia.
" 94. Pseudoblepsis.
" 95. Dysecoea.
" 96. Paracusis.

Genus 97. Anosmia.
" 98. Agheustia.
" 99. Anaesthesia.

Ordo II. Dysorexiae.

Sectio 1. Appetitus Erronei.

Genus 100. Bulimia.
" 101. Polydipsia.
" 102. Pica.
" 103. Satyriasis.
" 104. Nymphomania.
" 105. Nostalgia.

Sectio 2. Appetitus deficiens.

Genus 106. Anorexia.
" 107. Adipsia.
" 108. Anaphrodisia.

Ordo III. Dyscinesiae.

Genus 109. Aphonia.
" 110. Mutitas.
" 111. Paraphonia.
" 112. Psellismus.
" 113. Strabismus.
" 114. Dysphagia.
" 115. Contractura.

ORDO IV. APOCENOSES.

Genus 116. Profusio.
" 117. Ephidrosis.
" 118. Epiphora.
" 119. Ptyalismus.
" 120. Enuresis.
" 121. Gonorrhoea.

ORDO V. EPISCHESES.

Genus 122. Obstipatio.
" 123. Ischuria.
" 124. Dysuria.
" 125. Dyspermatismus.
" 126. Amenorrhoea.

ORDO VI. TUMORES.

Genus 127. Aneurysma.
" 128. Varix.
" 129. Ecchymoma.
" 130. Scirrhus.
" 131. Cancer.
" 132. Bubo.
" 133. Sarcoma.
" 134. Verruca.
" 135. Clavus.
" 136. Lupia.
" 137. Ganglion.

Genus 138. Hydatis.
" 139. Hydrarthrus.
" 140. Exostosis.

ORDO VII. ECTOPIAE.

Genus 141. Hernia.
" 142. Prolapsus.
" 143. Luxatio.

ORDO VIII. DIALYSES.

Genus 144. Vulnus.
" 145. Ulcus.
" 146. Herpes.
" 147. Tinea.
" 148. Psora.
" 149. Fractura.
" 150. Caries.

The simplicity and superiority of Cullen's system over those of his predecessors are easily valued, and show how much progress, in descriptive medicine, was made from 1760 to 1769, but it leaves much to be desired. Its defects are not few, and many of the enumerated genera are, in reality, species or only symptoms.

Sagar of Vienna published (1771–1776) a system of classification of diseases which is such as to constitute a retrogressive step in nosology. It consists of thirteen classes: 1, Vitia; 2, Plagae; 3, Cachexiae; 4, Dolores; 5, Fluxus; 6, Suppressiones; 7, Spasmi; 8, Anhelationes; 9, Debilitates; 10, Exanthemata; 11, Phlegmasiae; 12, Febres; 13, Vesaniae: fifty-four orders; three hundred and fifty-one genera; and twenty-five hundred species.

Macbride (1772) counts four classes: 1, Universal diseases; 2, Local diseases; 3, Sexual diseases; 4, Infantile diseases: twenty-three orders; and one hundred and eighty genera.

Selle's "*Iconographia systematis morborum naturalis*" (1773) contains eighteen classes: 1, Inflammatory diseases; 2, Putrid diseases; 3, Bilious diseases; 4, Pituitous diseases; 5, Verminous diseases; 6, Lacteous diseases; 7, Nervous diseases; 8, Periodic diseases; 9, Obstructions; 10, Gouty diseases; 11, Rachitic diseases; 12, Scrophulous diseases; 13, Cancerous diseases; 14, Venereal diseases; 15, Psoric diseases; 16, Scorbutic diseases; 17, Diseases produced by venoms; 18, Organic diseases: and forty-seven genera.

This and the four preceding systems were very poor competitors of Cullen's nosology which was finally, in France at least, replaced by Pinel's nosology.

Vitet (1778,) arranges diseases into eight classes: 1, Fevers; 2, Inflammations; 3, Painful diseases; 4, Convulsions; 5, Debilities; 6, Evacuatory diseases; 7, Diseases by retention of the solid and liquid matters; 8, Diseases of the mind: forty-three orders, and three hundred and ninety-four genera. (A worse system even than Sagar's.)

Darwin (1794–1796) adopts four classes: 1, Diseases of irritation; 2, Diseases of sensation; 3, Diseases of volition; 4, Diseases of association: eleven orders; forty-one genera; and four hundred and seventy-seven species. (An original and ingenious, but inconsistent, obscure and unpractical system.)

Pinel's (1798,) *nosographie philosophique* consists of five classes: 1, Fevers; 2, Phlegmasiae; 3, Haemorrhages; 4, Neuroses; 5, Organic lesions: twenty-two orders; and one hundred and forty-one genera.

Baumes published in 1801 a work with the title of *Fondemens de la science methodique des maladies*, in which he regards diseases as likely to result from the increase or from the diminution of certain chemical agents existing in the animal economy, such as caloric, oxygen, nitrogen, hydrogen, and phosphorus. This arrangement consists of five classes; several sub-classes;

ninety-seven genera; and a great number of species and sub-species.

CLASS I. Calorineses: diseases in which the dominant phenomena seem to consist of an alteration in the quantity of animal heat.

Sub-class 1. Supercalorineses: diseases caused by an augmentation of the animal heat.

Sub-class 2. Discalorineses: diseases in which the predominant phenomena seem to be owing to a diminution of the animal heat.

CLASS II. Oxygeneses; diseases in which the state of the system seems to be allied to an alteration in the normal quantity of oxygen in the economy.

Sub-class 1. Disoxygeneses: diseases caused by a notable diminution in the quantity of oxygen in the body.

Sub-class 2. Superoxygeneses: diseases where the oxygen is in excess.

CLASS III. Hydrogeneses: diseases in which the mucous secretion, the fats, the bile, the milk, offer characters of predominence or degeneration.

CLASS IV. Azoteneses: essentially putrid diseases, formed by the predominence of nitrogen in the economy.

CLASS V. Phosphoreneses: diseases attributed to an excess or a diminution of the phosphate of lime, or to its decomposition.

Supplementary class. This class contains seven genera and certain sub-genera consisting principally of traumatisms.

Pinel and Bricheteau, from whose article this and several of these abstracts were made, say, "We have almost nothing to say of Mr. Baumes' nosology, composed in a moment of effervescence,........ This work, long since judged, is already of the domain of history, and is a new proof of the great errors which may be committed by a man of talent........"

Tourdes published, in 1803, a new classification of diseases, consisting of four classes, nineteen orders, and fifty-one genera, founded upon the existence of three elementary tissues which he says form the basis of all the organs; these are the nervous, fibrous, and cellular or lymphatic, tissues.

Class I. Diseases of the fibrous or irritable tissue.

Class II. Diseases of the nervous and sensitive tissue.

Class III. Diseases of the cellular or lymphatic tissue.

Class IV. Complicated diseases. This class embraces simultaneous diseases of several systems or different tissues.

Tourtelle, in his *Elémens de medecine Theorique et Pratique* (1805,) inserts a system of nosology in which diseases are divided into six classes; one hundred and eighty-two genera; and seven hundred and nine species.

CLASS I. Pyrexiae.
CLASS II. Flux.
CLASS III. Suppressions.
CLASS IV. Neuroses.
CLASS V. Cachexiae.
CLASS VI. Vitia.

Récamier's system of nosology, extracted from the article of Pinel and Bricheteau in the *Dictionaire* des Sciences Medicales 1819, is as follows:

FIRST SECTION. Physiological diseases.

CLASS I. Alterations of the secretions.
CLASS II. Phlegmasiae.
CLASS III. Fevers.
CLASS IV. Neuroses.
CLASS V. Cachexiae.

SECOND SECTION. Anatomical diseases.

Class VI. Solution of the tissues.
Class VII. Displacements.
Class VIII. Physical vices of the arterial, venous or lymphatic circulation.
Class IX. Physical vices of the digestive, lacrymal, salivary, bilious, urinary, spermatic, and uterine excretions.
Class X. Deformities, congenital or accidental.
Class XI. Foreign bodies.

Each class contains four orders, and certain genera and species.

Crichton's system consists of eight classes; thirty orders; and one hundred and seventy-eight genera.

Parr, the author of the London Medical Dictionary, who so ably criticised the nosographers that were contemporaneous with, or preceded him, omitted classes and recognized only orders, of which he made twelve; genera, thirty-four; species, two hundred and twenty-one; and a number of sub-species and of varieties.

The following is a synopsis of Parr's system from which most of the species and all the sub-species and varieties are omitted.

SYNOPSIS OF PARR'S SYSTEM.

ORDER I. PYREXIAE.

Genus I. Intermittens.
[5 species].

Genus II. Exacerbans.
[3 species].

Genus III. Continua.

Sp. 1. Synocha.
" 2. Typhus.
[3 sub-species].
" 3. Synochus.

ORDER II. PHLEGMASIAE.

Genus I. Inflammatio.

Sp. 1. Phlegmon.
" 2. Ophthalmia.
" 3. Phrenitis.
" 4. Cynanche.
" 5. Pneumonia.
" 6. Hepatitis.
" 7. Carditis.
" 8. Gastritis.
" 9. Enteritis.
" 10. Nephritis.
" 11. Cystitis.

Sp. 12. Hysteritis.
" 13. Odontalgia.
[Various sub-species].

Genus II. Phlogosis.

Sp. 1. Erythema.
" 2. Phrenitica.
" 3. Anginosa.
" 4. Pneumonica.
" 5. Puerperalis.

Genus III. Catarrhus.

Sp. 1. Coryza.
[4 sub-species].
" 2. Dysenteria.
" 3. Phthisis.
" 4. Coeliaca.
" 5. Leucorrhoea.
" 6. Cystirrhoea.
" 7. Gonorrhoea.
" 8. Leucorrhois.

Genus IV. Arthritis.
[4 species].

Genns V. Exostosis.

Sp. 1. Periostea.

ORDER III. ERUPTIONES.

Genus I. Exanthemata.
[13 species].

Genus II. Efflorescentia.
[9 species].

ORDER IV. PROFLUVIA.

Genus I. Haemorrhagia.
[9 species, including Haematuria].

Genus II. Apocenosis,
[9 species, including Diabetes and Diuresis.]

ORDER V. SUPPRESSORII.

Genus I. Constrictoria.

Sp. 1. Dysphagia.
" 2. Obstipatio.
" 3. Polypus.

Genus II. Anhelatio.

Sp. 1. Asthma.
" 2. Dyspnoea.
[8 sub-species].

Genus III. Epischesis.
[9 species, among which]

Sp. 5. Ischuria
a. Renalis

b. Ureterica
c. Vesicalis
d. Urethralis.

Sp. 6. Dysuria
a. Ardens
b. Spasmodica
c. Compressionis
d. Irritata.

" 8. Dyspermatismus
a. Organicus
b. Spasmodicus.

ORDER VI. SPASMI.

Genus I. Tonos.

Sp. 1. Trismus.
" 2. Tetanus.
" 3. Contractura.
" 4. Priapismus.
" 5. Strabismus.

Genus II. Clonos.

[11 species].

ORDER VII. ADYNAMIAE.

Genus I. Coma.

[4 species].

Genus II. Anepithymia.
[7 species].

ORDER VIII. PARANOIAE.

Genus I. Morositas.
[3 species].

Genus II. Hallucinatio.

Sp. 1. Satyriasis.
" 2. Nymphomania.
" 3. Erotomania.

Genus III. Vesania.
[3 species].

ORDER IX. CACHEXIAE.

Genus I. Impetigo.

Sp. 1. Scorbutus.
" 2. Syphilis.
" 3. Aurigo.
" 4. Phaenigmus.
" 5. Melasma.
" 6. Rubigo.

Genus II. Macula.

Sp. 1. Ecchymosis.
" 2. Petechia.

ORDER X. INTUMESCENTIAE.

Genus I. Tuber.
[16 species].

Genus II. Phlegmatia.
[8 species, including Hydrocele].

Genus III. Cystis.
[6 species].

Genus IV. Emphysema.
[3 species].

ORDER XI. ECTOPIAE.

Genus I. Hernia.
[8 species].

Genus II. Prolapsus.
[7 species, including Exocyste].

Genus III. Luxatio.
[21 species].

ORDER XII. PLAGAE.

Genus I. Dialysis.
[7 species].

Genus II. Clasis.
[4 species].

Genus III. Diastasis.

Sp. I. Symphisis Pubis.

Swediaur enumerates five classes, thirty-two orders; and one hundred and thirty-eight genera.

Young, in his system of practical nosology, adopts five classes: (1,) Paraneurismi, diseases of the nervous and muscular system; (2,) Parhaemasiae, diseases of the sanguiferous system; (3,) Pareccrises, diseases of the secretions; (4,) Paramorphiae, structural diseases; (5,) Ectopiae, displacements: seven orders; and seventy-nine genera.

Richerand, in his *nosographie chirurgicale*, fourth edition, adopts only three classes: (1,) Physical lesions resulting from the action of a mechanical cause; (2,) Organic or structural lesions; (3,) Vital lesions: and fourteen orders.

Richerand afterwards introduced a new classification consisting of eight classes: (1,) Diseases which affect all the organic systems; (2,) Diseases of the sensitive apparatus; (3,) Diseases of the locomotory apparatus; (4,) Diseases of the digestive apparatus; (5,) Diseases of the circulatory apparatus; (6,) Diseases of the respiratory apparatus; (7,) Diseases of the cellular system; (8,) Diseases of the sexual organs: and sixteen orders.

Good's system comprises six classes: (1,) Coeliaca, diseases of the digestive function; (2,) Pneumatica, diseases of the respiratory function; (3,) Haematica, diseases of the sanguineous function; (4,) Neurotica, diseases of the nervous function; (5,) Genetica, diseases of the sexual function; (6,) Eccritica, diseases of the excernent function; and is further divided into orders, genera and species, as follows.

DOCTOR GOOD'S "TABLE OF CLASSIFICATION."*

CLASS. I. COELIACA.

Diseases of the digestive function.

ORD. I. ENTERICA.

Affecting the alimentary canal.

Gen. I. Odontia,

Misdentition.

Spec. 1. O. Dentitionis, (Teething.)
" 2. " Dolorosa, (Toothache.)
" 3. " Stuporis, (Toothedge.)
" 4. " Deformis, (Deformity of the teeth.)

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* Extracted from "The Study of Medicine," Vol. 1. London, 1822.

Spec. 5. O. Edentula, (Toothlessness.)
" 6. " Incrustans, (Tartar of the teeth.)
" 7. " Excressens, (Excrescent gums.)

Gen. II. Ptyalismus,
Ptyalism.

Spec. 1. P. Acutus, (Salivation.)
" 2. " Chronicus, (Chronic ptyalism.)
" 3. " Iners, (Drivelling.)

Gen. III. Dysphagia,
Dysphagy.

Spec. 1. D. Constricta, (Constrictive dysphagy.)
" 2. " Atonica, (Atonic disphagy.)
" 3. " Globosa, (Nervous quinsy.)
" 4. " Uvulosa, (Uvular dysphagy.)
" 5. " Linguosa, (Lingual disphagy.)

Gen. IV. Dipsosis,
Morbid thirst.

Spec. 1. D. Avens, (Immoderate thirst.)
" 2. " Expers, (Thirstlessness.)

Gen. V. Limosis,
Morbid appetite.

Spec. 1. L. Avens, (Voracity.)
" 2. " Expers, (Long fasting.)

Spec. 3. " Pica, (Depraved appetite.)
" 4. " Cardialgia, (Heart-burn, Water-brash.)
" 5. " Flatus. (Flatulency.)
" 6. " Emesis, (Sickness, vomiting.)
" 7. " Dyspepsia, (Indigestion.)

Gen. VI. Colica,
Colic.

Spec. 1. C. Ileus, (Iliac passion.)
" 2. " Rhachialgia, (Colic of Poitou, Painters colic.)
" 3. " Cibaria, (Surfeit.)
" 4. " Flatulenta, (Wind colic.)
" 5. " Constipata, (Constipated colic.)
" 6. " Constricta, (Constrictive colic.)

Gen. VII. Coprostasis,
Costiveness.

Spec. 1. C. Constipata, (Constipation.)
" 2. " Obstipata, (Obstipation.)

Gen. VIII. Diarrhoea,
Looseness.

Spec. 1. D. Fusa, (Feculent looseness.)
" 2. " Biliosa, (Bilious looseness.)

Spec. 3. " Mucosa, (Mucous looseness.)
" 4. " Chylosa, (Chylous looseness.)
" 5. " Lienteria, (Lientery.)
" 6. " Serosa, (Serous looseness.)
" 7. " Tubularis, (Tubular looseness.)
" 8. " Gypsata, (Gypseous looseness.)

Gen. IX. Cholera,
Cholera.

Spec. 1. C. Biliosa, (Bilious cholera.)
" 2. " Flatulenta, (Wind cholera.)
" 3. " Spasmodica, (Spasmodic cholera.)

Gen. X. Enterolithus,
Intestinal concretions.

Spec. 1. E. Bezoardus, (Bezoar.)
" 2. " Calculus, (Intestinal calculus.)
" 3. " Scybalum, (Scybalum.)

Gen. XI. Helminthia,
Worms.

Spec. 1. H. Alvi, (Alvine worms.)
" 2. " Podicis, (Anal worms.)
" 3. " Erratica, (Erratic worms).

Gen. XII. Proctica,
Proctica.

Spec. 1. P. Simplex, (Simple proctica.)
" 2. " Spasmodica, (Spasmodic stricture of the rectum.)
" 3. " Callosa, (Callous stricture of the rectum.)
" 4. " Tenesmus, (Tenesmus.)
" 5. " Marisca, (Piles.)
" 6. " Exania, (Prolapse of the fundament.)

ORD. II. SPLANCHNICA,
Affecting the collatitious viscera.

Gen. I. Icterus,
Yellow Jaundice.

Spec. 1. I. Choloeus, (Biliary jaundice.)
" 2. " Chololithicus, (Gall-stone jaundice.)
" 3. " Spasmodicus, (Spasmodic jaundice.)
" 4. " Hepaticus, (Hepatic jaundice.)
" 5. " Infantum, (Jaundice of infants.)

Gen. II. Melaena,
Melena.

Spec. 1. M. Choloea, (Black, or green jaundice.)
" 2. " Cruenta, (Black vomit.)

Gen. III. Chololithus,
Gall-stone.

Spec. 1. C. Quiescens, (Quiescent gall-stone.)
" 2. " Means, (Passing of gall-stones.)

Gen. IV. Parabysma,
Visceral turgescence.

Spec. 1. P. Hepaticum, (Turgescence of the liver.)
" 2. " Splenicum, (Turgescence of the spleen.)
" 3. " Pancreaticum, (Turgescence of the pancreas.)
" 4. " Mesentericum, (Turgescence of the mesentery.)
" 5. " Intestinale, (Turgescence of the intestines.)
" 6. " Omentale, (Turgescence of the omentum.)
" 7. " Complicatum, (Turgescence compounded of various organs.)

CLASS. II. PNEUMATICA.

Diseases of the respiratory function.

ORD. I. PHONICA,

Affecting the vocal avenues.

Gen. I. Coryza,

Running at the nose.

Spec. 1. C. Entonica, (Entonic coryza.)
" 2. " Atonica, (Atonic coryza.)

Gen. II. Polypus,

Polypus.

Spec. 1. P. Elasticus, (Compressible polypus.)
" 2. " Coriaceus, (Cartilaginous polypus.)

Gen. III. Rhonchus,

Rattling in the throat.

Spec. 1. R. Stertor, (Snoring.)
" 2. " Cerchnus, (Wheezing.)

Gen. IV. Aphonia,

Dumbness.

Spec. 1. A. Elinguium, (Elingual dumbness.)
" 2. " Atonica, (Atonic dumbness.)
" 3. " Surdorum, (Deaf-dumbness.)

Gen. V. Dysphonia,
Dissonant voice.

Spec. 1. D. Susurrans, (Whispering voice.)
" 2. " Puberum, (Voice of puberty.)
" 3. " Immodulata, (Immelodious voice.)

Geu. VI. Psellismus,
Dissonant speech.

Spec. 1. P. Bambalia, (Stammering.)
" 2. " Blaesitas, (Misenunciation.)

ORD. II. PNEUMONICA,
Affecting the lungs, their membranes, or motive power.

Gen. I. Bex,
Cough.

Spec. 1. B. Humida, (Common or tumid cough.)
" 2. " Sicca, (Dry cough.)
" 3. " Convulsiva, (Hooping cough.)

Gen. II. Laryngysmus,
Laryngic suffocation.

Spec. 1. L. Stridulus, (Stridulous constriction of the larynx.)

Gen. III. Dyspnoea,
Anhelation.

Spec. 1. D. Chronica, (Short-breath.)
" 2. " Exacerbans, (Exacerbating anhelation.)

Gen. IV. Asthma,
Asthma.

Spec. 1. A. Siccum, (Dry or nervous asthma.)
" 2. " Humidum, (Humid or common asthma.)

Gen. V. Ephialtes,
Incubus.

Spec. 1. E. Vigilantium, (Day-mare.)
" 2. " Nocturnus, (Night-mare.)

Gen. VI. Sternalgia,
Suffocative breast-pang.

Spec. 1. S. Ambulantium, (Acute breast-pang.)
" 2. " Chronica, (Chronic breast-pang.

Gen. VII. Pleuralgia,
Pain in the side.

Spec. 1. P. Acuta, (Stitch.)
" 2. " Chronica, (Chronic pain in the side.)

CLASS. III. HAEMATICA,

Diseases of the sanguineous function.

Ord. I. Pyretica,

Fevers.

Gen. I. Ephemera,

Diary fever.

Spec. 1. E. Mitis, (Wild diary fever.)
" 2. " Acuta, (Acute diary fever.)
" 3. " Sudatoria, (Sweating fever.)

Gen. II. Anetus,

Intermitting fever. Ague.

Spec. 1. A. Quotidianus, (Quotidian ague.)
" 2. " Tertianus, (Tertian ague.)
" 3. " Quartanus, (Quartan ague.)
" 4. " Erraticus, (Irregular ague.)
" 5. " Complicatus, (Complicated ague.)

Gen. III. Epanetus,

Remittent fever.

Spec. 1. E. Mitis, (Wild remittent.)
" 2. " Malignus, (Malignant remittent.)
" 3. " Hectica, (Hectic fever.)

Gen. IV. Enecia,
Continued fever.

Spec. 1. E. Cauma, (Inflammatory fever.)
" 2. " Typhus, (Typhus fever.)
" 3. " Synochus, (Synochal fever.)

ORD. II. PHLOGOTICA,
Inflammations.

Gen. I. Apostema,
Aposteme.

Spee. 1. A. Commune, (Common aposteme.)
" 2. " Psoaticum, (Psoas abscess.)
" 3. " Hepaticum, (Abscess of the liver.)
" 4. " Empyema, (Lodgement of matter in the chest.)
" 5. " Vomica, (Vomica.)

Gen. II. Phlegmone,
Phlegmon.

Spec. 1. P. Communis, (Common phlegmon.)
" 2. " Parulis, (Gum boil.)
" 3. " Auris, (Imposthume in the ear.)
" 4. " Parotidea, (Parotid phlegmon.)
" 5. " Mammae, (Abscess of the breast.)
" 6. " Bubo, (Bubo.)
" 7. " Phimotica, (Phimotic phlegmon.)

Gen. III. Phyma,
Tubercle.

Spec. 1. P. Hordeolum, (Sty.)
" 2. " Furunculus, (Boil.)
" 3. " Sycosis, (Sycous phyma.)
" 4. " Anthrax, (Carbuncle.)

Gen. IV. Ionthus,
Whelk.

Spec. 1. I. Varus, (Stone-pock.)
" 2. " Corymbifer, (Carbuncled face, Rosy drop.)

Gen. V. Phlysis,
Phlysis.

Spec. 1. P. Paronychia, (Whitlow.)

Gen. VI. Erythema,
Inflammatory blush.

Spec. 1. E. Oedematosum, (Edematous inflammation.)
" 2. " Erysipelatosum, (Erysipelatous inflammation.)
" 3. " Gangraenosum, (Gangrenous inflammation.)
" 4. " Vesiculare, (Vesicular inflammation.)

Spec. 5. E. Pernio, (Chilblain.)
" 6. " Intertrigo, (Fret.)

Gen. VII. Empresma,

Visceral inflammation.

Spec. 1. E. Cephalitis, (Inflammation of the brain.)
" 2. " Otitis, (Ear-ache.)
" 3. " Parotitis, (Mumps.)
" 4. " Paristhmitis, (Quinsy.)
" 5. " Laryngitis, (Inflammation of the larynx.
" 6. " Bronchitis, (Croup.)
" 7. " Pneumonitis, (Peripneumony.)
" 8. " Pleuritis, (Pleurisy.)
" 9. " Carditis, (Inflammation of the heart.)
" 10. " Peritonitis, (Inflammation of the peritoneum.)
" 11. " Gastritis, (Inflammation of the stomach.)
" 12. " Enteritis,(Inflammation of the bowels.)
" 13. " Hepatitis, (Inflammation of the liver.)
" 14. " Splenitis, (Inflammation of the spleen.)
" 15. " Nephritis, (Inflammation of the kidneys)
" 16. " Cystitis,(Inflammation of the bladder.)

Spec. 17. E. Hysteritis, (Inflammation of the womb.)
" 18. " Orchitis, (Inflammation of the testicles.)

Gen. VIII. Ophthalmia,
Ophthalmy.

Spec. 1. O. Taraxis, (Lachrymose ophthalmy.)
" 2. " Iridis, (Inflammation of the iris.)
" 3. " Purulenta, (Purulent ophthalmy.)
" 4. " Glutinosa, (Glutinous ophthalmy.)
" 5. " Chronica, (Lippitude, Blear eye.)

Gen. IX. Catarrhus,
Catarrh.

Spec. 1. C. Communis,(Cold in the head or chest.)
" 2. " Epidemicus, (Influenza.)

Gen. X. Dysenteria,
Dysentery.

Spec. 1. D. Simplex, (Simple dysentery.)
" 2. " Pyrectica, (Dysenteric fever.)

Gen. XI. Bucnemia,
Tumid leg.

Spec. 1. B. Sparganosis, (Puerperal tumid leg.)
" 2. " Tropica, (Tumid leg of hot climates.)

Gen. XII. Arthrosia.
Articular inflammation.

Spec. 1. A. Acuta, (Acute rheumatism.)
" 2. " Chronica, (Chronic rheumatism.)
" 3. " Podagra, (Gout.)
" 4. " Hydrarthrus, (White-swelling.)

ORD. III. EXANTHEMATICA,
Eruptive fevers, Exanthems.

Gen. I. Enanthesis,
Rash, Exanthem.

Spec. 1. E. Rosalia, (Scarlet-fever.)
" 2. " Rubeola, (Measles.)
" 3. " Urticaria, (Nettle-rash.)

Gen. II. Emphlysis,
Ichorous exanthem.

Spec. 1. E. Miliaria, (Miliary fever.)
" 2. " Aphtha, (Thrush.)
" 3. " Vaccinia, (Cow-pox.)
" 4. " Varicella, (Water-pox.)
" 5. " Pemphigus, (Vesicular or bladdery fever.)
" 6. " Erysipelas, (St. Anthony's fire.)

Gen. III. Empyesis,
Pustulous exanthem.

Spec. 1. E. Variola, (Small-pox.)

Gen. IV. Anthracia,
Carbuncular exanthem.

Spec. 1. A. Pestis, (Plague.)
" 2. " Rubula, (Yaws.)

ORD. IV. DYSTHETICA,
Cachexies.

Gen. I. Plethora,
Plethora.

Spec. 1. P. Entonica, (Sanguine phthora.)
" 2. " Atonica, (Serous plethora.)

Gen. II. Haemorrhagia,
Haemorrhage.

Spec. 1. H. Entonica, (Entonic Haemorrhage.)
" 2. " Atonica, (Atonic Haemorrhage.)

Gen. III. Marasmus,
Emaciation.

Spec. 1. M. Atrophia, (Atrophy.)
" 2. " Climactericus, (Decay of nature.)

Spec. 3. M. Tabes, (Decline.)
" 4. " Phthisis, (Consumption.)

Gen. IV. Struma,
Scrophula.

Spec. 1. S. Vulgaris, (King's evil.)

Gen. V. Carcinus,
Cancer.

Spec. 1. C. Vulgaris, (Common cancer.)

Gen. VI. Lues,
Venereal disease.

Spec. 1. L. Syphilis, (Pox.)
" 2. " Syphilodes, (Bastard pox.)

Gen. VII. Elephantiasis,
Elephant-skin.

Spec. 1. E. Arabica, (Arabian elephantiasis, Black leprosy.)
" 2. " Italica, (Italian elephantiasis.)
" 3. " Asturiensis, (Asturian elephantiasis.)

Gen. VIII. Catacausis,
Catacausis.

Spec. 1. C. Ebriosa, (Inebriate catacausis.)

Gen. IX. Porphyra,
Scurvy.

Spec. 1. P. Simplex, (Petecchial scurvy.)
" 2. " Haemorrhagica, (Land-scurvy.)
" 3. " Nautica, (Sea-scurvy.)

Gen. X. Exangia,
Exangia.

Spec. 1. E. Aneurisma, (Aneurism.)
" 2. " Varix, (Varix.)
" 3. " Cyania, (Blue-skin,)

Gen. XI. Gangraena,
Gangrene.

Spec. 1. G. Sphacelus, (Mortification.)
" 2. " Ustilaginea, (Mildew-mortification.)
" 3. " Necrosis, (Dry gangrene.)
" 4. " Caries, (Caries.)

Gen. XII. Ulcus,
Ulcer.

Spec. 1. U. Incarnans, (Simple healing ulcer.)
" 2. " Vitiosum, (Depraved ulcer.)
" 3. " Sinuosum, (Sinuous ulcer.)
" 4. " Tuberculosum, (Warty, excrescent ulcer.)
" 5. " Cariosum, (Carious ulcer.)

CLASS. IV. NEUROTICA,

Diseases of the nervous function.

ORD. I. PHRENICA,

Affecting the intellect.

Gen. I. Ecphronia,

Insanity, Craziness.

Spec. 1. E. Melancholia, (Melancholy.)
" 2. " Mania, (Madness.)

Gen. II. Empathema,

Ungovernable passion.

Spec. 1. E. Entonicum, (Empassioned excitement.)
" 2. " Atonicum, (Empassioned depression.)
" 3. " Inane, (Hair-brained passion.)

Gen. III. Alusia,

Illusion, Hallucination.

Spec. 1. A. Elatio, (Sentimentalism, Mental ex-extravagance.)
" 2. " Hypochondrias, (Hypochondrism, Low spirits.)

Gen. IV. Aphelxia,
Revery.

Spec. 1. A. Socors, (Abscence of mind.)
" 2. " Intenta, (Abstraction of mind.)
" 3. " Otiosa, (Brown-study.)

Gen. V. Paroniria,
Sleep-disturbance.

Spec. 1. P. Ambulans, (Sleep-walking.)
" 2. " Loquens, (Sleep-talking.)
" 3. " Salax, (Night-pollution.)

Gen. VI. Moria,
Fatuity.

Spec. 1. M. Imbecillis, (Imbecility.)
" 2. " Demens, (Irrationality.)

ORD. II. AESTHETICA,
Affecting the sensation.

Gen. I. Paropsis,
Morbid sight.

Spec. 1. P. Lucifuga, (Night-sight.)
" 2. " Noctifuga, (Day-sight.)
" 3. " Longinqua, (Long-sight.)

Spec. 4. P. Propinqua, (Short-sight.)
" 5. " Lateralis, (Skue-sight.)
" 6. " Illusoria, (False-sight.)
" 7. " Caligo, (Opaque comea.)
" 8. " Glaucosis, (Humoral opacity.)
" 9. " Catarracta, (Cataract.)
" 10. " Synizesis, (Closed pupil.)
" 11. " Amaurosis, (Drop serene.)
" 12. " Staphyloma, (Protuberant eye.)
" 13. " Strabismus, (Squinting.)

Gen. II. Paracusis,
Morbid hearing.

Spec. 1. P. Acris, (Acute hearing.)
" 2. " Obtusa, (Hardness of hearing.)
" 3. " Perversa, (Perverse hearing.)
" 4. " Duplicata, (Double hearing.)
" 5. " Illusoria, (Imaginary sounds.)
" 6. " Surditas, (Deafness.)

Gen. III. Parosmis,
Morbid smell.

Spec. 1. P. Acris, (Acute smell.)
" 2. " Obtusa, (Obtuse smell.)
" 3. " Expers, (Want of smell.)

Gen. IV. Parageusis,
Morbid taste.

Spec. 1. P. Acuta, (Acute taste.)
" 2. " Obtusa, (Obtuse taste.)
" 3. " Expers, (Want of taste.)

Gen. V. Parapsis,
Morbid touch.

Spec. 1. P. Acris, (Acutc sense of touch or general feeling.)
" 2. " Expers, (Insensibility of touch or general feeling.)
" 3. " Illusoria, (Illusory sense of touch or general feeling.)

Gen. VI. Neuralgia,
Nerve-ache.

Spec. 1. N. Faciei, (Nerve-ache of the face.)
" 2. " Pedis, (Nerve-ache of the foot.)
" 3. " Mammae, (Nerve-ache of the breast.)

ORD. III. CINETICA,
Affecting the muscles.

Gen. I. Entasia,
Constrictive spasm.

Spec. 1. E. Priapismus, (Priapism.)
" 2. " Loxia, (Wry-neck.)
" 3. " Articularis, (Muscular stiff-joint.)
" 4. " Systremma, (Cramp.)
" 5. " Trismus, (Locked-jaw.)
" 6. " Tetanus, (Tetanus.)
" 7. " Lissa, (Rabies, Canine madness.)
" 8. " Acrotismus, (Suppressed pulse.)

Gen. II. Clonus,
Clonic spasm.

Spec. 1. C. Singultus, (Hiccough.)
" 2. " Sternutatio, (Sneezing.)
" 3. " Palpitatio, (Palpitation.)
" 4. " Nictitatio, (Twinkling of the eye lids.)
" 5. " Subsultus, (Twitching of the ten dons.)
" 6. " Pandiculatio, (Stretching.)

Gen. III. Synclonus,
Synclonic spasm.

Spec. 1. S. Tremor, (Trembling.)
" 2. " Chorea, (St. Vitus' dance.)
" 3. " Ballismus, (Shaking palsy.)
" 4. " Raphania, (Raphania.)
" 5. " Beriberia, (Barbiers.)

ORD. IV. SYSTATICA,
Affecting several or all the sensorial powers simultaneously.

Gen. I. Agrypnia,
Sleeplessness.

Spec. 1. A. Excitata, (Irritative wakefulness.)
" 2. " Pertaesa, (Chronic wakefulness.)

Gen. II. Dysphoria,
Restlessnes.

Spec. 1. D. Simplex, (Fidgets.)
" 2. " Anxietas, (Anxiety.)

Gen. III Antipathia,
Antipathy.

Spec. 1. A. Sensilis, (Sensile antipathy.)
2. " Insensilis, (Insensile antipathy.)

Gen. IV. Cephalaea,
Head-ache.

Spec. 1. C. Gravans, (Stupid head-ache.)
" 2. " Ecstasis, (Ecstasy.)
" 3. " Catalepsia, (Catalepsy.)
" 4. " Lethargus, (Lethargy.)
" 5. " Apoplexia, (Apoplexy.)
" 6. " Paralysis, (Palsy.)

CLASS. V. GENETICA,
Diseases of the sexual function.

ORD. I. CENOTICA,
Affecting the fluids.

Gen. I. Paramenia,
Mismenstruation.

Spec. 1. P. Obstructionis, (Obstructed menstruation.)
" 2. " Difficilis, (Laborious mentruation.)
" 3. " Superflua, (Excessive menstruation.)
" 4. " Erroris, (Vicarious menstruation.)
" 5. " Cessationis, (Irregular cessation of the menses.)

Genus II. Leucorrhoea,
Whites.

Spec. 1. L. Communis, (Common whites.)
" 2. " Nabothi, (Labour-show.)
" 3. " Senescentium, (Whites of advanced life.)

Gen. III. Blennorrhoea,
Gonorrhoea.

Spec. 1. B. Simplex, (Simple urethral running.)
" 2. " Luodes, (Clap.)
" 3. " Chronica, (Gleet.)

Gen. IV. Spermorrhoea,
Seminal flux.

Spec. 1. S. Entonica, (Entonic seminal flux.)
" 2. " Atonica, (Atonic seminal flux.)

Gen. V. Galactia,
Mislactation.

Spec. 1. G. Praematura, (Premature milk-flow.)
" 2. " Defectiva, (Deficient milk-flow.)
" 3. " Depravata, (Depraved milk-flow.)
" 4 " Erratica, (Erratic milk-flow.)
" 5. " Virorum, (Milk-flow in males.)

ORD. II. ORGASTICA,
Affecting the orgasm.

Gen. I. Chlorosis.
Green-sickness.

Spec. 1. C. Entonica, (Entonic green-sickness.)
" 2. " Atonica, (Atonic green-sickness.)

Gen. II. Proeotia.
Genital precocity.

Spec. 1. P. Masculina, (Male precocity.)
" 2. " Feminina, (Female precocity.)

Gen. III. Lagnesis,
Lust.

Spec. 1. L. Salacitas, (Salacity.)
" 2. " Furor, (Lascivious madness.)

Gen. IV. Agenesia,
Male sterility.

Spec. 1. A. Impotens, (Male impotency.)
" 2. " Dyspermia, (Seminal-mis-emission.)
" 3. " Incongrua, (Copulative incongruity.)

Gen. V. Aphoria,
Female sterility, Barrenness.

Spec. 1. A. Impotens, (Barrenness of impotency.)
" 2. " Paramenica, (Barrenness of mis-menstruation.)
" 3. " Impercita, (Barrenness of irrespondence.)
" 4. " Incongrua, (Barrenness of incongruity.)

Gen. VI. Aedoptosis,
Genital prolapse.

Spec. 1. A. Uteri, (Falling down of the womb.)
" 2. " Vaginae, (Prolapse of the vagina.)
" 3. " Vesicae, (Prolapse of the bladder.)
" 4. " Complicata, (Complicated genital prolapse.)
" 5. " Polyposa, (Genital excrescence.)

ORD. III. CARPOTICA,
Affecting the impregnation.

Gen. I. Paracyesis,
Morbid pregnancy.

Spec. 1. P. Irritativa, (Constitutional derangement of pregnancy.)

Spec. 2. " Uterina, (Local derangement of pregnancy.)
" 3. " Abortus, (Abortion.)

Gen. II. Parodynia,
Morbid labour.

Spec. 1. P. Atonica, (Atonic labour.)
" 2. " Implastica, (Unpliant labour.)
" 3. " Sympathetica, (Complicated labour.)
" 4. " Perversa, (Preternatural presentation.)
" 5. " Amorphica, (Impracticable labour.)
" 6. " Pluralis, (Multiplicate labour.)
" 7. " Secundaria, (Sequential labour.)

Gen. III. Eccyesis,
Extra-uterine-fetation.

Spec. 1. E. Ovaria, (Ovarian exfetation.)
" 2. " Tubalis, (Tubal exfetation.)
" 3. " Abdominalis, (Abdominal exfetation.)

Gen. IV. Pseudocyesis,
Spurious pregnancy.

Spec. 1. P. Molaris, (Mole.)
" 2. " Inanis, (False conception.)

CLASS. VI. ECCRITICA,
Diseases of the excernent function.

Ord. I. Mesotica,
Affecting the parenchyma.

Gen. I. Polysarcia,
Corpulency.

Spec. 1. P. Adiposa, (Obesity.)

Gen. II. Emphyma,
Tumour.

Spec. 1. E. Sarcoma, (Sarcomatous tumour.)
" 2. " Encystis, (Encysted tumour.)
" 3. " Exostosis, (Bony tumour.)

Gen. III. Parostia,
Mis-ossification.

Spec. 1. P. Fragilis, (Fragility of the bones.)
" 2. " Flexilis, (Flexility of the bones.)

Gen. IV. Cyrtosis,
Contortion of the bones.

Spec. 1. C. Rhachia, (Rickets.)
" 2. " Cretinismus, (Cretinism.)

Gen. V. Osthexia,
Osthexy.

Spec. 1. O. Infarciens, (Parenchymatous osthexy.)
" 2. " Implexa, (Vascular osthexy.)

ORD. II. CATOTICA,
Affecting internal surfaces.

Gen. I. Hydrops,
Dropsy.

Spec. 1. H. Cellularis, (Cellular dropsy.)
" 2. " Capitis, (Dropsy of the head.)
" 3. " Spinae, (Dropsy of the spine.)
" 4. " Thoracis, (Dropsy of the chest.)
" 5. " Abdominis, (Dropsy of the belly.)
" 6. " Ovarii, (Dropsy of the ovaries.)
" 7. " Tubalis, (Dropsy of the Fallopian tubes.)
" 8. " Uteri, (Dropsy of the womb.)
" 9. " Scroti, (Dropsy of the scrotum.)

Gen. II. Emphysema,
Inflation, Wind-dropsy.

Spec. 1. E. Cellulare, (Cellular inflation.)
" 2. " Abdominis, (Tympany.)

Gen. III. Paruria,
Mismicturition.

Spec. 1. P. Inops, (Destitution of urine.)
" 2. " Retentionis, (Stoppage of urine.)
" 3. " Stillatitia, (Strangury.)
" 4. " Mellita, (Saccharine urine, Diabetes.)
" 5. " Incontinens, (Incontinence of urine.)
" 6. " Incocta, (Unassimilated urine.)
" 7. " Erratica, (Erratic urine.)

Gen. IV. Lithia,
Urinary calculus.

Spec. 1. L. Renalis, (Renal calculus.)
" 2. " Vesicalis, (Stone in the bladder.)

ORD. III. ACROTICA,
Affecting the external surface.

Gen. I. Ephidrosis,
Morbid sweat.

Spec. 1. E. Profusa, (Profuse sweat.)
" 2. " Cruenta, (Bloody sweat.)
" 3. " Partialis, (Partial sweat.)
" 4. " Discolor, (Coloured sweat.)
" 5. " Olens, (Scented sweat.)
" 6. " Arenosa, (Sandy sweat.)

Gen. II. Exanthesis,
Cutaneous blush.

Spec. 1. E. Roseola, (Rose-rash.)

Gen. III. Exormia,
Papulous skin.

Spec. 1. E. Strophulus, (Gum-rash.)
" 2. " Lichen, (Lichenous-rash.)
" 3. " Prurigo, (Pruriginous-rash.)
" 4. " Milium, (Millet rash.)

Gen. IV. Lepidosis,
Scale-skin.

Spec. 1. L. Pityriasis, (Dandriff.)
" 2. " Lepriasis, (Leprosy.)
" 3. " Psoriasis, (Dry-scall.)
" 4. " Icthyiasis, (Fish-skin.)

Gen. V. Ecphlysis,
Blains.

Spec. 1. E. Pompholyx, (Water-blebs.)
" 2. " Herpes, (Tetter.)
" 3. " Rhypia, (Sordid-blain.)
" 4. " Eczema, (Heat eruption.)

Gen. VI. Ecpyesis,
Humid scall.

Spec. 1. E. Impetigo, (Running scall.)
" 2. " Porrigo, (Scabby scall.)
" 3. " Ecthyma, (Papulous scall.)
" 4. " Scabies, (Itch.)

Gen. VII. Malis,
Cutaneous vermination.

Spec. 1. M. Pediculi, (Lousiness.)
" 2. " Pulicis, (Flea-bites.)
" 3. " Acari, (Tick-bite.)
" 4. " Filariae, (Guinea worm.)
" 5. " Oestri, (Gad-fly bite.)
" 6. " Gordii, (Hair worm.)

Gen. VIII. Ecphyma,
Cutaneous excrescence.

Spec. 1. E. Caruncula, (Caruncle.)
" 2. " Verruca, (Wart.)
" 3. " Clavus, (Corn.)
" 4. " Callus, (Callus)

Gen. IX. Trichosis,
Morbid hair.

Spec. 1. T. Setosa, (Bristly hair.)
" 2. " Plica, (Matted hair.)

Spec. 3. T. Hirsuties, (Extraneous hair.)
" 4. " Distrix, (Forky hair.)
" 5. " Poliosis, (Gray hairs.)
" 6. " Athrix, (Baldness.)
" 7. " Area, (Areated hair.)
" 8. " Decolor, (Miscolored hair.)

Gen. X. Epichrosis,
Macular-skin.

Spec. 1. E. Leucasmus, (Weal-skin.)
" 2. " Spilus, (Mole.)
" 3. " Lenticula, (Freckles.)
" 4. " Ephelis, (Sun-burn.)
" 5. " Aurigo, (Orange-skin.)
" 6. " Poecilia, (Pye-balled-skin.)
" 7. " Alphosis, (Albino-skin.)

Good's classification is exhaustive but his nomenclature very fanciful. The following are among the many blemishes contained in his system of classification.

Abscess of the breast, bubo, and gum-boil, are placed as species of the same genus; sty is in the same genus as anthrax; chilblain with erysipelatous inflammation; croup with peritonitis, inflammation of the brain, carditis, nephritis, cystitis, etc.; gout with white swelling; aphtha with pemphigus and erysipelas; priapism with wry-neck and locked-jaw, etc., and yet Good is considered as the greatest of all classifiers.

Alibert, in his *Nosologie naturelle ou les maladies du corps humain distribuées par families*, groups diseases, in accordance with the organs affected, into certain classes, families and genera as follows:

FIRST CLASS. Trophopathies, or diseases which attack the functions of assimilation.

First family. Gastroses, diseases whose principal seat is in the stomach; thirteen genera.

Second family. Enteroses, enteric diseases; ten genera.

Third family. Choloses, diseases of the biliary apparatus; eleven genera.

Fourth family. Uroses, diseases of the urinary apparatus; twelve genera.

Fifth family. Pneumoses, diseases of the respiratory organs; eight genera.

Sixth family. Angioses, diseases of the circulatory system; nineteen genera.

Seventh family. Leucoses, diseases of the serous and lymphatic system; twelve genera.

Eighth family. Adenoses, diseases of the glandular system; five genera.

Ninth family. Ethmoplecoses, diseases of the cellular tissuse; six genera.

Tenth family. Blennoses, diseases of the mucous membranes; eleven genera.

This system of nosography does not appear to have been completed.

Doctor Hosack's system consists of eight classes; twenty-five orders; and one hundred and ninety-eight genera.

The *Dictionnaire de Médecine*, second edition Paris 1841, Volume 23rd, p. 240, contains an article with the heading *pathologie*, by Raige-Delorme, and in this article is included a classification of diseases which is here reproduced as an example of the decline of nosography in the country of its birth.

RAIGE-DELORME'S CLASSIFICATION.

CLASS I. General diseases whose anatomical conditions are unknown.

ORDER 1. Pyrexiae.

Genus 1. Essential pyrexiae.
" 2. Pyrexiae having, besides their febrile phenomena, certain constant anatomical or physiological characters.
" 3. Exanthematic pyrexiae.
" 4. Symptomatic pyrexiae.

ORDER 2. General cachaectic diseases.
(Tuberculosis, melanosis, and the divers degenerations.)

CLASS II. Mixed diseases.
(General and local.)

CLASS III. Local diseases.

ORDER 1. Phlegmasiae.

ORDER 2. Haemorrhagiae.

ORDER 3. Diseases which result in degeneration of the tissues; an analogous or a heterologous organic production: tubercle, cancer, melanosis, etc.

ORDER 4. Dropsies.

ORDER 5. Fluxes.

ORDER 6. Pneumatoses.

CLASS IV. Neuroses.—Diseases characterised by a trouble in the functions of the nervous system, without appreciable textural lesions.

The different genera of neuroses are,
Neuroses of the cephalo-rhachidian centres;

Neuroses of the senses;
Neuralgiae;
Neuroses of the respiratory organs;
Neuroses of the heart;
Neuroses of the digestive organs.

CLASS V. Virulent diseases.
(Syphilis, variola, vaccinia.)

CLASS VI. Poisoning.

CLASS VII. Asphyxiae.

CLASS VIII. Mechanical or Surgical diseases.

This comparatively modern classification and its nomenclature, abound in the greatest inconsistencies and inaccuracies, and in the most flagrant violations of the simplest rules of classification and nomenclature, to say nothing of the pathological inaccuracies and the defective definitions. The name of the first class is objectionable on account of its length and obscurity. The author, instead of naming the second genus of the first order of this classs, attempts to describe it. In the second order of the first class he mixes tuberculosis and melanosis with the "different degenerations" and repeats them in the third order of the third class. The second class is as objectionable as the first class. Among the orders of the third class are jumbled up, phlegmasiae, haemorrhagiae, dropsies, fluxes, and pneumatoses. He defines, and inaccurately too, instead of naming, the third order of this third class.

Taking into consideration the excellent work, in the direction of arrangement, performed in France for more than a century prior to the appearance of this classification, it is past comprehension that so inexact and unsatisfactory a classification should have appeared from the pen of a writer in the great medical encyclopedia of a country so renowned for its medical talent.

All of the nosographers so far mentioned have enumerated only a very few of the affections of the uro-genital apparatus.

A number of other nosographies which have more or less merit are noticed under the head of bibliography.

As pertinent to the subject, Doctor Williams' tabular arrangement of structural diseases or diseases of nutritition is here reproduced from the American edition of his work published in the year 1853.*

- Diseased Nutrition
  - Increased.—Hypertrophy
  - Diminished.—Atrophy
  - Perverted
    - Induration
    - Softening
    - Transformation
    - Deposits
      - Euplastic
        - Cicatrices
        - False membranes
      - Cacoplastic
        - Cirrhosis
        - Fibro-cartilage
        - Gray tubercle
        - Atheroma, etc.
      - Aplastic
        - Yellow tubercle
        - Calareous matter, etc.
    - Growths
      - Non-malignant
        - Cysts
        - Tumors
        - Hydatids, etc.
      - Malignant
        - Carcinoma
        - Encephaloma
        - Melanosis, etc.
- Altered Mechanism
  - Contraction
  - Dilatation
  - Obstruction
  - Compression
  - Displacement
  - Rupture, etc.

* Principles of medicine, etc., by Charles J. B. Williams, M. D., F. R. S. etc. American edition by Meredith Clymer, M. D., Philadelphia 1853. The American editor has contributed much to exact nomenclature, particularly in his writings of the last twenty years.

ON THE PRINCIPLES OF CLASSIFICATION.

Sir William Aitken, in his "Science and Practice of Medicine," third edition, published in London in the year 1864, under the head "Principles of Classification," says:

"Many systems of nosology have been adopted from time to time; and as valuable general principles have been adduced from some, the grounds on which diseases have been classified may be briefly described under the following nine heads:

"I. The nature of the ascertained causes of disease. On this principle two classes of diseases are recognised: (1,) Diseases arising from general causes; (2,) Diseases arising from specific causes.

"II. The pathological states and conditions which attend diseases. The principle of this classification consists in determining alterations of the structure or the chemical composition of parts, from which names are given to the disease......

"III. The properties, powers, or functions of an organ or system of organs being deranged, dictates a classification in which the most prominent effects or phenomena of morbid states are considered as the disease......

"IV. The diseases comprehended under the two latter principles of classification are sometimes inaccurately and loosely brought together under the heads of structural and functional diseases. The diseases of function, for instance, being made to embrace the neuroses, haemorrhages, and dropsies; while inflammation, tubercle, cancer, melanosis, hypertrophy and atrophy are the subordinate classes of the diseases of structure.

"V. A basis of classification has been adopted, founded on the pathological nature of the different morbid processes, but the arrangement of the orders and subdivisions is determined by the anatomical arrangement of the textures and organs of the animal body, as originally developed by Bichat.

"VI. A ground of classification exists, having reference to the general nature and localisation of the morbid states. It comprehends three classes: (1,) Diseases which occupy the whole system at the same time, and in which all the functions are simultaneously deranged. These have been named general diseases, such as fevers; (2,) Constitutional affections, meaning thereby diseases which display themselves in local lesions in any part but not in all parts at the same time—e. g., rheumatism, gout; (3,) Local morbid processes.

"VII. Applying the principles of a purely humoral pathology, we have a classification consisting of—a. Fevers; b. Dyscrasiae—e. g., tabes, chlorosis, scorbutus, dropsy, diabetes, pyaemia, tuberculosis, carcinoma; c. Constitutional diseases, induced by,—(1,) specific agents, (2,) vegetable substances.

"Such is Wunderlich's arrangement of diseases (1852).

"VIII. Mr. de Savignac, Professor of Clinical Medicine at the Naval School of Toulon, has recently (1861) propounded a nosological arrangement (which he considers a natural one) founded on what he believes to be the 'elements' of disease. His so called elements seem to be vague general expressions, or names to denote the leading phenomena of diseases or the unknown cause of such phenomena......

"IX. Doctor Stark, of Edinburgh, has recently (1864) proposed an arrangement embracing sixteen classes: (1,) Fevers; (2,) Diseases of the brain, etc.; (3,) Diseases of the heart and organs of circulation; (4,) Diseases of the organs of respiration; (5,) Diseases of the organs of digestion; (6,) Diseases of the urinary organs; (7,) Diseases of the organs of generation; (8,) Diseases of the organs of locomotion; (9,) Diseases of the skin and cellular tissue; (10,) Diseases of uncertain seat; (11,) Malformation; (12,) Debility at birth, and premature birth; (13,) Old age; (14,) Sudden deaths; (15,) Violent or unnatural deaths; (16,) Causes not specified......

"......Classification conducted on the plan proposed by Doctor Stark is inconsistent with any intelligible principle of arrangement.

"None of these nine principles of classification lead to a perfectly philosophical or purely natural classification, because diseases are not yet sufficiently understood to permit us to see clearly their mutual relations; and the best recommendation of any one of them would be a negative one—namely, that of doing the least possible violence to our imperfect knowledge regarding the natural affinities or alliances of diseases, of which we have at present only a sort of instinctive recognition......"

The system adopted by Sir W. Aitken in nearly all the editions of his work is that of Doctor William Farr, and consists of five classes as follows: (1,) Zymotic diseases, four orders; (2,) Constitional diseases, two orders; (3,) Local diseases, eleven orders; (4,) Developmental diseases, four orders; (5,) Lesions from violence tending to sudden death, six orders. In all twenty-seven orders.

Doctor Farr's system, says Sir W. Aitken, was discussed at several meetings of the statistical congress of the European nations, in Paris (1855), and in Vienna (1857), where a nomenclature similar to the English was adopted, but no definite classification was agreed upon.

LABORS OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

A joint committee, of which Doctor William Farr was a member, appointed by the Royal College of Physicians of London to draw up a nomenclature of diseases, published its first report in the year 1869, after more than ten years of labor. In this report, one thousand one hundred and forty-six diseases are enumerated, exclusive of human parasites of which fifty-five are counted. The committee very properly offered this nomenclature as only provisional and suggested that it be subjected to decennial revisions. The main object of the work, as set forth in the preface, was to lay "the foundation for a nomenclature of diseases in any language extant on the earth."

This nomenclature has been reprinted by order of the chief of the United States Marine Hospital Service, in 1874, and a few years ago a part of the first decennial revision was printed by order of the New York State Board of Health.

In the year 1869 the American Medical Association appointed a committee "to determine what alterations, if any, are necessary, to adapt the Provisional Nomenclature of the Royal College of Physicians of London to general use in the United States." This Committee reported, in 1870, "that the English nomenclature was not adapted to this end, and recommended the appointment of a new committee to prepare a nomenclature of their own." The new committee was appointed with Dr. Francis Gurney Smith, as Chairman and, in 1872, presented its report and nomenclature, based upon the English system. A minority report was then submitted to the Association. Both reports were accepted, but only the following resolution, appended to the minority report was adopted.

"Resolved, That the Nomenclature and classification just submitted by the committee be published in the Transactions; that one thousand extra copies be printed in pamphlet form and distributed to the profession, and that the question of the adoption of the proposed Nomenclature and classification by this body be postponed till the next annual meeting."

The extra copies of the nomenclature were distributed in accordance with the resolution offered by the minority of the committee, and at the next annual meeting (1873) of the Association a majority report was again presented. But it was urged that the American nomenclature was inferior to the English and after some discussion, the following resolutions were adopted.

"Resolved, That in the opinion of this Association, it is inexpedient to adopt the nomenclature and classification presented by the majority of the committee on nomenclature at the meeting in Philadelphia."

"Resolved, That a committee of three be appointed by the President, whose duty it shall be to communicate the foregoing resolution to the proper committee of the Royal College of Physicians of London, and to negotiate for the representation of the American Medical Association in the first decennnial revision of their nomenclature."

The committee was duly appointed, but has never made any report.

In the second edition of the official nomenclature of the Royal College of Physicians of London (1885), it seems as though the committee had failed to take advantage of many of the medical advances of the decade, for, aside from the violations of established principles of nomenclature and classification which it contains, much of the old medical terminology is retained, and many symptoms are still classed as diseases.

It is needless to indulge in any extended criticism of this new nomenclature, since it has already been so fairly and exhaustively reviewed. The reader is therefore referred to the excellent critical analysis of the London nomenclature by Doctor A. Rabagliati, of Bradford, England. This review, which is well worthy of the most careful study, first appeared in the "Medical Press and Circular," and then in book form.*

The dermatologists have contributed largely to systematic arrangement for a century past. Their bibliography begins with the nomenclature of Celsus, of Mercurialis (1572), and of Riolan (1610), from which they trace their systematic arrangement of dermatoses down to Auspitz † (1881) and Bronson ‡ (1884 and 1887). Their

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* Some remarks on the classification and nomenclature of diseases, by A. Rabagliati, M. A., M. D., reprinted from the Medical Press and Circular.—London, Baillière, Tyndall, and Cox, 1886.

† For a very extended dermatographical bibliography, and synopsis of divers systems, see Auspitz' system der Hautkrankheiten, Vienna 1881.

‡ E. B. Bronson. The objects of dermatological classification, with especial reference to Auspitz' system. Journal of cutaneous and venereal diseases. Vol. II, June 1884.

work however requires a very extensive revision, if not an entire reconstruction.

The preceding outline of the history of nosography, and of the synopses of a few of the old systems, is here given with the view of placing the reader in possession of the methods of the nosographers in a compact form, in order that he may see almost at a glance the defects of the early essays and compare them with the modern systems before he contributes his share to the improvement of this science.

A few of the nosographers, to whose labors allusion has been made in the historical outline have worked with great fidelity and earnestness for the improvement of this science, while the great majority have simply copied their predecessors and reproduced their most obvious errors without the least attempt at correction.

Some of the rules formulated by the early writers are appended to this history.

E. B. Bronson. A study of the considerations relating to the classification of skin diseases with an attempt to construct a logical system in accordance with fundamental principles of etiology. Pamphlet, pp. 19. Reprinted from the Journal of cutaneous and genito-urinary diseases. October 1887.

RULES FOR THE GUIDANCE OF THE NOSOGRAPHER.

The following rules, for the guidance of nosographers, laid down by Cullen, Parr, Linnaeus and Young, are given in full because of their general excellence and because they illustrate so well the principles of nomenclature and classification, besides carrying with them the authoritative weight of these eminent men who labored with so much ardor for the advancement of nosography.

Cullen's nosography appeared in the year 1769. He therefore had the benefit of the experience of Sauvages, Linnaeus and Vogel. He endeavored to improve upon them, and formulated certain rules for distinguishing genera, species, and varieties. These rules are here reproduced, although some of them do not now possess the value which they may have had at the time of their publication.*

CULLEN'S RULES FOR DISTINGUISHING GENERA, SPECIES AND VARIETIES.

1. "Those who have turned their attention to this subject hitherto, have not I think proceeded with due consideration. They have gone at once

* Edinburgh edition 1800.

to constitute the principal genera of the classes and orders, without sufficiently attending to the species of diseases. Now nature has made nothing but species; the structure of genera is an effort of the human mind, which, till the species are well known and understood, must be fallacious and uncertain; and indeed, in constituting genera, unless we have perpetual reference to the species, all our labor will prove futile and vain.

2. "It is certainly a very difficult thing in nosology to say what is a true species, or what is only a variety; as those marks which serve to distinguish species from varieties in zoology and botany, are not to be found in diseases. I therefore considered it as safest and even necessary to enumerate many varieties. And as I esteem such a distinction very useful in practice, I have everywhere endeavored to make it: not always indeed with equal certainty, but often, at least, with some degree of probability.

3. "When any disease, under which several men labour, exhibits, in each individual, all the symptoms that characterise a certain species, I would not consider that these were different species, because the symptoms prevailed in one patient in a greater or less degree, than in an-

other. And I am of opinion that diseases which differ only in a degree, constitute merely varieties of a certain species.

4. "Accordingly in distinguishing a variety from a species, there is only room for doubt when, in the diseases of different persons, any symptoms are wanting which generally accompany a species, or when others are present.

5. "When any of the usual symptoms are wanting; and we can distinguish between those that are more and those that are less essential, I consider the absence of such symptoms as indicative of a variety only.

6. "When to the characteristic symptoms, others are added, which can be reckoned the symptoms of symptoms, rather than the symptoms of the cause, they constitute only a variety.

7. "Again, when these additional symptoms are quite unusual, while, at the same time, the principal circumstances of the disease are little or not at all changed; these too afford only a variety.

8. "When any genus of disease may arise from different causes, the diversity of the cause may occasion likewise diversity in the species, though not always; for when the difference is small, and the symptoms at the same time are little affected

by it, that difference will constitute only a variety.

9. "A genus of disease may, in the same manner, produce different species, according to the diversity of its seat; but as often as the seat is different, while there is no difference either with respect to the structure of the part or its functions, this diversity of seat can only indicate a variety."

In the edition of 1827, Cullen remarks, that in nosology, by beginning with the characters of the class, and from thence descending to orders and genera, the term genus has been very universally applied to species, and that, by imitation, he had been led to do the same thing, for, of the one hundred and thirty three genera which he had established in his first edition, a hundred are properly species, and admit of no farther division except into varieties. He further said, "the characters of diseases are formed by a concourse of various symptoms, every particular of which, in the language of methodical writers, is a nota or mark: now, in forming the character, the first, and the most important rule is, that these marks should be neither more nor fewer than are absolutely necessary. If we have more, we pass from characters or definitions to descriptions;

we leave persons in doubt when they find a disease with the strictly essential character, by adding other circumstances which they may suppose to be equally necessary. The nosologists have been faulty in giving both superfluous and deficient characters.

"A second rule is, that the marks which we employ should be sufficiently evident, and if possible, constantly present at every period of the disease, these at least (that) are the most characteristic. Nosologists transgress against this rule when the marks are taken from the duration, and much more from the event of the disease. To affirm that a disease is a fatal one, is indeed a part of its history, but cannot serve as a character when we first view the disease.

"The third rule is, that the notae chosen should be expressed in clear and very intelligible terms, and, if possible, in terms the meaning of which is already fixed in science...... The want of due precision of language affects many parts of all our systems. It is well known, that the want of precision in the use of terms for a long time retarded the perfection of botany; and it has been the greatest merit of Linnaeus, that he gave much more precision, and a determined meaning to almost every word employed in that science, which he did by forming a *delineato plantae*, by fixing a term for every part of a plant, and for all the circumstances in which these parts can vary. But we will not bring nosology to a good condition till something of the same kind, a *delineatio morbi*, be attempted, which ought to consider all the symptoms that enter into a specific character in another view than that taken by the pathologists, who only trace them to their causes. Here we ought to examine the symptoms more minutely with respect to the variety of their appearance, and affix terms to them accordingly.

"The fourth rule, is that the characters should be absolutely free and independent from all theory and hypothesis........ Every species ought to have the character of its genus; and in naming or distinguishing species,......it is supposed sufficient merely to name the genus, and to add such marks as distinguish the species."

PARR'S RULES.

Under the head of classification Dr. Parr says:

1. "It is said that nature has created only species: it is not true; for she has created only individuals. The similarity of these has occasioned the establishment of species. Individuals,

differing in circumstances arising from accident; in plants and animals, from soil and climate; in diseases, from constitution; in minerals, from locality, are styled varieties; and these, when circumstances are changed, return to the species from which they started. These distinctions, though apparently simple and obvious, are however, necessary; for naturalists have usually begun at the other extremity, and formed 'methods,' classes, and orders before they have established species and, at this moment, in nosology and mineralogy, the greatest impediments to improvement arise from the uncertainty of what are species. Even in botany this difficulty was once so great, that more than half of Tournefort's supposed species have been found to be varieties only. Three-fourths of Sauvages' species of diseases are varieties or symptoms.*........

2. "This is the first step in arrangement; for the establishment of species consists in ascertaining identity; of genera similarity. A striking discriminating mark, in many species, sometimes

* The criticism made, by Dr. Parr of Sauvages' species of diseases, three quarters of a century ago, will apply, to a very great extent, to the two editions of the modern English nomenclature, for they both include many symptoms classed as diseases.

establishes a genus; at others, a general similarity. The conduct of botanists, however, has differed in this part of their labor, from the difference of their dispositions. Some naturalists, catching hastily at analogies, have included numerous species under a genus: others more wary and exact, have retrenched them too rigorously. The latest botanists have rendered the genera more, sometimes too, numerous; but this of the two is the more venial error, since new discoveries continually enlarge them.

3. "An order is an association of genera; but orders are usually too comprehensive, including too great a number of genera; and to facilitate investigation, these are often divided into separate groups, as in mineralogy the species are sometimes divided into sub-species. Each is a proof of imperfection in arrangement.

4. "A class contains the different orders; and though in reality, it should be the last, or nearly the last, labourer, it has usually been the first; and to make the system elegant in appearance, the classes have been few and comprehensive."

APHORISMS RELATING TO CLASSIFICATION, TAKEN CHIEFLY FROM THE PHILOSOPHIA BOTANICA OF LINNAEUS, BY DOCTOR THOMAS YOUNG.

Of generic characters.

1. "The foundation of methodical science consists of two parts, arrangement and nomenclature.

2. "Arrangement is either theoretical, relating to classes, orders, and genera, or practical, relating to species and varieties.

3. "Arrangement or method is either synoptical or systematic.

4. "A synopsis depends on arbitrary divisions proceeding in pairs at each step, and is not admissible in botany, except as a key or index.

5. "A system proceeds in its arrangement by five steps; classes, orders, genera, species, and varieties.

6. "System is the Ariadnean thread, without which all is confusion.

7. "Species in natural history are supposed to have been originally created distinct.

8. "Varieties may be as numerous as the individuals which have been produced.

9. "Genera are determined in botany from the agreement of the parts of fructification.

10. "Classes are deduced from the regular agreement of many genera, in the parts which characterise them.

11. "An order is a subdivision of a class, intended for convenience.

12. "Species and genera depend on nature; varieties often on cultivation; classes and orders on a combination of nature and art.

13. "Habit is a general agreement in growth and appearance.

14. "Habit is to be silently consulted in forming genera, but must not and cannot be described.

15. "No positive rules can be laid down respecting identity of genus.

16. "Few genera are without some cases of accidental deviation.

17. "Each genus is commonly characterised by some decided singularity of form.

18. "Genera thus marked must be kept distinct or united accordingly.

19. "The more constant the mark in different species, the better distinction it affords.

20. "Different parts are the most constant in different genera; but scarcely any part is ever wholly invariable.

21. "A generic character is the definition of a genus, and may be of three kinds, factitious, essential, or natural.

22. "An essential character affords a singular and appropriate criterion of the genus. Its excellence depends on its brevity.

23. "A factitious character distinguishes the genus only from others of the same artificial order.

24. "A natural character contains everything remarkable that is found in all the species of the genus. It may often require alteration when new species are discovered.

25. "A factitious character is a substitute for an essential one, which is always the best when it can be obtained. A natural character is a work of great labor, but, when completed, it is the basis of all systems, the guardian of genera, and is applicable to every correct and practicable mode of arrangement.

26. "No character can be infallible unless it has been compared with all the species of the genus.

27. "A generic character must not contain comparisons, except with things perfectly well known.

28. "The character must be expressed in se-

lect, accurate, distinct, and compendious terms, sufficient in number, but not superfluous.

29. "The character must remain invariable in every possible system that can be adopted. With this precaution, the introduction of a new system is no misfortune.

30. "A genus may consist of a single species, although it more usually contains several species.

31. "What is established respecting the characters of genera must be understood, with some latitude, of those of classes.

32. "Classes are more arbitrary than genera, orders than either.

33. "The more naturally classes are established the better.

34. "Great difficulty arises from the excessive length or number of classes and orders.

35. "Genera which are allied to each other ought to stand together.

Of names.

36. "He who establishes a new genus is bound also to give it a name.

37. "A generic name must be decided on before a specific one is formed.

38. "No man in his senses would employ a generic name destitute of etymological meaning.

39. "Generic names consisting of two entire and separate words are prohibited.

40. "Generic names consisting of two Latin words united together are scarcely to be tolerated. Such compounds of Greek origin, on the contrary, are elegant.

41. "Generic names of hybrid origin, for instance partly Greek and partly Latin, are to be rejected.

42. "Generic names including other generic names are unworthy of a scientific nomenclature.

43. "Generic names ending in oides are prohibited.

44. "Generic names derived from others by the addition of a syllable are disapproved.

45. "Generic names very nearly resembling each other are likely to cause confusion.

46. "Generic names not derived from Greek or Latin are forbidden.

47. "Generic names common to natural history and anatomy, pathology, therapeutics, or the arts, are to be avoided. (Thus lichen must not be a genus of diseases: and I have been obliged to change the name spiloma into spilosis, having

found that the botanists had taken possession of this too.)

48. "Generic names contradicting the properties of some of the species are bad.

49. "Generic names must not be identified with those of natural classes or orders.

50. "Diminutives and derivatives of a similar nature are allowable as generic names. (The diminutives of other generic names are however scarcely admissible.)

51. "Adjectives are inferior to substantives as generic names.

52. "Generic names which have already been employed are to be preferred where it can be done without inconvenience. (Sometimes however it is better to employ a new term than to alter materially the application of an old one.)

53. "Such generic names as express an essential character or habit are the best.

54. "An ancient name should be employed for a genus long established.

55. "A good name once established ought not to be changed, even for a better or more ancient one.

56. "If a genus is to be divided, the old name

must remain attached to the most common species.

57. "Generic names are to be written in Latin letters, the Greek letters being expressed according to the established custom.

58. "The sounds of generic names are to be softened as much as possible.

59. "Long and harsh names are to be avoided. Names should scarcely exceed twelve letters.

60. "Terms of art ought not to be employed for generic names.

61. "Names of classes and orders are to be governed by the same rules as those of genera. The name is to be single; not unmeaning, hybrid, barbarous, equivocal, inapposite, personal, too long, nor harsh.

62. "Names of classes and orders should include their characteristic marks.

Of specific differences.

63. "A perfect name includes a generic and a specific name. All solid learning in natural history, agriculture, and medicine, depends on the knowledge of species.

64. "A legitimate specific name or character distinguishes the species from all others of the

same genus. Trivial names, often called specific names, are subjected to no very accurate rules.

65. "All specific characters which distinguish the species from others, not of the same genus, are superfluous and bad.

66. "Trivial names are only limited to a single word. (Substantives have an advantage over adjectives, as being more convenient when brevity is required......)

67. "Specific characters must be taken from circumstances not subject to vary.

68. "Magnitude affords no specific distinction. (Thus the degree of putrescency scarcely affords a sufficient distinction between nervous and putrid fever.)

69. "Comparisons with other genera are to be excluded from specific characters.

70. "Comparisons with other species of the same genus are bad.

71. "Care must be taken to exclude varieties from the rank of species.

72. "Each species must bear the name of the genus.

73. "The specific name must always follow the generic. The idea of the genus must occur first to the mind.

74. "A specific name without the generic is like a bell without a clapper.

75. "The specific name must not be united to the generic as a termination.

76. "A genuine specific character is either synoptic or essential.

77. "A synoptic specific character distinguishes the species of the genus by successive subdivisions into two portions. In large genera such subdivisions are often indispensable.

78. "An essential specific character exhibits a single distinction, appropriate to one species only.

79. "The shorter a specific character can be made, the better, provided that it be sufficient.

80. "Specific characters must contain only such words as are necessary for distinguishing the species from others of the same genus.

81. "When a genus contains only one species, a specific character is superfluous. (There may however be cases in which a character, pointed out as likely to be essential, by a person well acquainted with the species, may be useful in distinguishing it from others subsequently discovered.)

82. "When a new species of a genus is dis-

covered, the characters of all the other species must be accommodated to it, if they become inadequate.

83. "The words forming a specific character are not to be compounds resembling generic names, nor purely Greek, but Latin; and the more simple they are, the better.

84. "The specific character ought not to be embellished by the flowers of rhetoric, but natural and faithful.

85. "The specific character admits neither comparatives nor superlatives.

86. "The specific character must be expressed in positive terms, not negative. (Privatives are often unavoidable, although in some measure objectionable......)

87. "Resemblances, if ever employed for specific characters, must be striking and well known.

88. "Adjectives must immediately follow their substantives.

89. "Conjunctive particles are to be excluded from specific characters, except where they are necessary to the sense.

90. "Successive adjectives are not to be separated by commas.

91. "A specific character must never contain

a parenthesis, whether distinguished or not by the appropriate mark. A parenthesis is bad, as implying a defect of order.

Of varieties.

92. "To the generic name and specific character the distinction of a variety may be added, where it exists.

93. "The generic names, the specific character, and the marks of varieties, are to be printed in different types.

94. "Very slight varieties are to be disregarded.

95. "The specific character must agree with all the varieties, as far as is practicable.

96. "It is often as difficult and as important to reduce varieties to their proper species, as species to their proper genus.

Of Synonyms,

97. "Among the synonyms enumerated, the most approved name is to be set down first.

98. "Authors who have employed the same synonyms are to be quoted together.

99. "Each synonym is to begin a new line.

100 "Synonyms must be accompanied by the names of the authors, and the pages of the works in which they are to be found."

The student of nosography may, with profit, consult the modern system of "*Laws of Botanical Nomenclature*" which was adopted by the International Botanical Congress held at Paris in August, 1867, and which was published together with a historical introduction and a commentary by Alphonse De Candolle.

SECTION III.

Nosographical Bibliography.

A chronological list of the works on nosography that have appeared from the time of Felix Platerus to the present.

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Junius, (Adrianus)—Nomenclator. Francofurti, 1620.

Johnstonus, (J.)—Idea Universalis Medicinae. Amsteldami, 1644.

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SAUVAGES, (F. B. de)—Nosologia Methodica. Lugduni, 1760. Geneva, 1763.

HEBENSTREIT, (Johannes Ernestus)—Programmata, Ordo Morborum Causalis. Leipsiae, 1754—1757.

HEBENSTREIT, (J. E.)—Exegesis nominum graecorum, quae morbos definiunt. Lipsiae, 1751—1761.

LINNAEUS, (Carolus)—Genera morborum. Upsalae, 1759—1763.

VOGEL, (Rudolphus Augustus)—Dissertatio, Definitiones Generum Morborum. Goetingae, 1764.

PLENK, (J. J.)—Novum Systema Tumorum qui hi morbi in sua genera et species rediguntur. Vienna, 1767.

CULLENUS, (Guiliemus)—Synopsis Nosologiae Methodicae in Usum Studiosorum. Edin., 1769,—1772,—1780.

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ACKERMANN, (J. F.)—Programma sistens nosologiam Holsaticam. Kiloniae, 1773.

HARTUNG, ( )—Diss. de generali morborum divisione. Aug. Trev., 1777.

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VITET, (Louis)—Médecine expectante. Lyons, 1778. (Containing a nosological method.)

HAARTMANN, (J. J.)—Diss. Sciagraphiae morborum. Aboae, 1779.

CIRILLIO, (D.)—Nosologiae Methodicae Rudimenta. Napoles, 1780.

TODE, (J. C.) Copenhagen, 1781.

DANIEL, (Chris. Fredericus)—Systema aegritudinum. Leipsiae, 1781.

GIESEKE, ( )—Animadversiones in systema nosologicum. Goettingae, 1781.

VACHIER, ( )—"Méthode nosologique." Paris, 1785.

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VAN HEUVELL, ( )—Tentamen nosologicum, sistens morborum a vitio vis vitalis divisionem et dispositionem practicam. Lugduni Batav., 1787.

SPRENGEL, (Curtius)—Rudimentorum nosologiae dynamicorum prolegomena. Hallae, 1787.

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PLOUCQUET, (Guil. Godofredus)—Delineatio systematis nosologici naturae accomodati. Tubingae, 1791.

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DARWIN, (Erasmus)—Zoonomia. London, 1794—1796.

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CAILLAU, (Jean Marie)—Premières lignes de nosologie enfantine. Bordeaux, 1797.

PINEL, (Philip)—Nosographie philosophique. Paris, 1798—1818.

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NEBEL, (E. L. W.)—Specimen nosologiae brutorum cum hominum morbis comparatae. Giessae, 1798.

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WILLAN, (Robert)—Description and Treatment of cutaneous diseases. London, 1798—1807.

BRERA, (Valeriano Luigi)—Classificazione delle malatie secondo i principi di Brown, si premette una definizione dei vocaboli propri del sistema Browniano. Venet., 1799.

HORN, (Ernst)—Versuch einer praktischen nosologie der fieber. Brunsvic, 1800.

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Tourdes, (J.)—Esquisse d'un système de nosologie, fondé sur la physiologie et la thérapeutique. Strasbourg, 1802.

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Tourtelle, (E.)—Elémens de médecine théorique et pratique. 1805.

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SECTION IV.

BASIS AND METHOD OF THE CLASSIFICATION AND CHARACTER OF THE NOMENCLATURE OF THE DISEASES OF MAN.

Many high authorites opposed to classification. To think is to classify. Characteristics of good classifiers. Modern classifiers use terms of classification arbitrarily without taking the pains to define these terms. Nosography on the basis of symptoms misleading and retrogressive. Anatomy the only stable basis for nosography. Description and definition of diseases. Methods of the nosographer. The use of the dead languages in nomenclature. The names of men should not be applied to diseases. Suggestions for an improved classification of diseases. A consense of views necessary in the use of terms of classification. Questions suggested for discussion at the Tenth International Medical Congress. Definitions of the terms of classification.

As preliminary to the further consideration of human nosography, the following questions may with propriety be propounded:

1. Is there need of classification of any kind?

2. If so, what should be the basis of the classification of diseases?

3. What should be the character of the nomenclature of diseases?

4. What should be the method of the classification of diseases?

An answer to each of these questions will now be submitted to the decision of the medical profession, for no official nosography should be established except with the concurrence of the medical profession.

I. IS THERE NEED OF CLASSIFICATION OF ANY KIND?

Despite the well known aphorism, "system is the Ariadnean thread without which all is confusion," some of the highest authorities in science have been opposed to methodical arrangement. Among them may be cited the celebrated Buffon. Many of the physicians of the present time do not approve of classification notwithstanding the fact that medicine is a science only by reason of the methodical arrangement of diseases, and that these physicians themselves are constantly classifying, for they think and therefore classify, and it is a fact that to think is to classify, therefore in thinking they classify *nolens volens.** To think of

* "Looking....... to the experience of the past, it cannot, with any reason, be urged that systematic arrangements, if consistent with existing knowledge ever cramp or hamper a man in carrying out scientific investigations; on the contrary, they enable him to see more clearly in what direction his labor must be advanced, and demonstrate more forcibly than otherwise the deficiencies of his knowlege." (Aitken.)

an object is to recognise the properties which differentiate it from other objects and consequently place it in its proper class.—Particular illustrations need not be given.—But to make a general classification accurate and useful requires profound thinking, a good understanding, sound judgment, persevering study, careful observation, persistent labor, untiring industry, and the co-operation of many men possessing these qualities. Nosotaxy however to be of practical utility to the medical profession, and of much benefit to mankind, requires more than the co-operation of many men. It exacts the prompt and substantial aid of the very great majority of all true physicians in the world.

The answer to the first question is that there is great need of a classification of the diseases of man, established upon a proper basis, which shall constitute an epitome of the science of medicine.

2. WHAT SHOULD BE THE BASIS OF THE CLASSIFICATION OF DISEASES?

During this century nosography has not advanced so rapidly as might have been reasonably expected. Among the chief reasons of this hinderance are; (1,) that the establishment of a proper basis for its development has never been agreed upon by the medical profession, and (2,) that no particular system of classification has been officially adopted by the profession. Individuals and certain nations having each some special system of classification and nomenclature of diseases, with no apparent aim toward uniformity. In sundry nosographical arrangements the words groups, sections, classes, orders, families, tribes, genera, and species, are so loosely and carelessly employed that it is difficult to understand the meaning which these terms are intended to convey, used, as they often are, in violation of established principles of classification, for many classifiers employ them arbitrarily and do not take the pains to give their own definitions of these arbitrary terms.

The starting point in nearly all the systems of nosography is the symptom. This has led astray many nosographers who, mistaking symptoms for diseases, placed these symptoms in the category of diseases, notwithstanding the existing excellent rules for the guidance of the student of nosography. The system of Cullen having been judged the best was, for many years, in general use, and yet it was full of the most glaring errors, some of which he acknowledged in after years. Many of Parr's suggestions were excellent, but his system was as ill founded as those of his predecessors. Pinel's "*nosographie philosophique*," which superseded the nosology of Cullen in France, has long been obsolete. It failed, even after a very considerable number of revisions, probably because it was established upon the same faulty basis as that of former systems. The nosographical contributions of Récamier, of Richerand and of others had no better success. More than forty years ago Doctor Williams classified and tabulated certain diseases upon a physio-pathological basis, but there halted.

It seems clear that the great defect of all these systems is the lack of a stable basis upon which to erect the structure of nosography. This defect was long ago realised but not remedied, and nosography had already shown signs of decay when it was almost entirely reconstructed by Doctor William Farr and by the Royal College of Pysicians of London. But even the modern English system is full of inconsistencies although it is declared to be founded upon anatomy.

It is noteworthy that nearly all the early general nosographers were at either extreme of adopting very few or very many classes, and that they failed to agree as to what should constitute classes, orders, genera, species, or symptoms, for these are scattered throughout what at first sight seem to be the most methodical arrangements.

Thus phlegmasiae are placed among classes by Sauvages, Linnaeus, and Sagar, and among orders by Cullen, Vogel, Macbride, and Good. These, and many other blemishes already pointed out, occur from the time of Sauvages to that of Hosack, and are owing partly to the fact that too little attention has been bestowed upon species notwithstanding the caution of Cullen who, however, fell into the error he so much wished to avoid, and partly to the state of knowledge of physiology and morbid anatomy at that epoch. Although Doctor Good based his nosology upon physiology, he reaffirmed many of the errors of the older authors.

This want of agreement, and the absence of a substantial foundation and of associated harmonious labor, have given rise to the greatest confusion in the use of terms and in arrangement. This confusion and the tendency of each nosographer to reproduce the inaccuracies of his predecessors, have greatly impeded the progress of nosography and have led to much unfavorable criticism and to the frequently asked question, "of what use is nosography"?—This question is now often sneeringly asked by those who fail to appreciate the fact that, without the existing systematic arrangement of diseases, they could not have learned, and could not intelligently and successfully practise, medicine.—In the beginning of this century nosography was not regarded with much favor by many learned physicians both in England and on the continent of Europe, and the mass of the profession spoke of it contemptuously. Doctor Parr, in commenting thereon says: "nosology is seldom mentioned but to be ridiculed and despised." *

Under the same head, Parr says:

"Systems are the work of our own minds; for nature advances by almost imperceptible shades; and where we cannot point out the termination of one family, and the commencement of another, it is only confessing that the intermediate link is unknown: thus when our knowledge advances the advantages of our system lessen, for our limits are lost.............

"If a foundation could be obtained, it was apparently by considering the disorder as connected with an internal change, which would then afford what might be styled an object, whose properties we might examine.. ....

"The great advantage of nosology is distinction, discrimination, etc............. We still want a *delineatio morbi* in imitation of the *delineatio plantae* in Linnaeus."

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* The London Medical Dictionary. London, 1809.

How can proper distinction, discrimination, and a *delineatio morbi* be made unless nosography have a stable foundation such, for instance, as can be built from anatomy? As early as the year 1801 Bayle was of opinion that nosography should be founded upon anatomy, but the idea was never fully carried out, although Alibert named his families of diseases in accordance with the organs affected, although Richerand and others made similar attempts, and although the modern English system is avowedly founded upon anatomy.*

It was an error of much consequence on the part of the nosographers to make symptoms the foundation of the science instead of using them as *one* of the means by which to discover individual diseases. An anatomical foundation would in no way have lessened the importance of symptomatology and of semeiology, for, however substantial might have been the foundation of nosography, its superstructure could never have been built without proper methods of detecting and of expressing the characteristics of diseases. It is

* The latest work of Sauvages (published a year after his death) contained a symptomatical, an etiological, and an anatomical arrangement, but the etiological and anatomical were held in entire subordination to the symptomatical arrangement.

chiefly by the aid of symptoms and signs that individual affections are recognised and species established, and it is from species that the superstructure rises.

While due consideration should be given to symptoms, it would, in the present state of science, seem unwise to attempt to make a *delineatio morbi* solely upon the basis of symptoms, for, without placing under contribution aetiology and pathoanatomy, it would not be possible to fix a term for every circumstance in which the morbid conditions might vary. For example, in the case of a deformity, the description of its external charaters would be insufficient and its definition inexact if the cause and pathic properties were not set forth. This cause may be an injury, or a previous disease, or the deformity may be congenital. Again, an echmatic affection may be owing to a congenital anomaly, to a previous disease, or to an injury. A tumor may consist of fat, or of muscular or fibrous tissue, of cartilage, or of bone, or of cellular elements which are rapidly proliferated to be soon destroyed. In such cases, symptoms would indicate simply the existence of a tumor of a certain size and shape and its immediate effects, but not its anatomical properties. To make the description of an abnormal condition of the human body accurate and its definition exact, all the circumstances connected with it should be closely scrutinised and analyzed, whether they be external manifestations, or physical signs brought to light by the aid of certain tests systematically applied, as for instance, in the case of the sense of hearing in auscultation, of touch in palpation, or of other methods of physical exploration. At the same time the greatest importance should be attached to the causes and to the pathic properties of these conditions as revealed by the modern appliances for determining the anatomical and other characters of diseases, such as chemical tests, the electrical apparatus, the microscope, the polariscope, and other instruments of precision.

Cullen speaks of the difficulty he experienced in determining what is really a true species and what is only a variety, and finds it necessary to enumerate many varieties. This difficulty doubtlessly arose from his adopting a system based upon symptoms rather than upon anatomy. Some of his rules for discriminating between species and varieties would now be of little value and must have been very unsatisfactory in his own time. For instance, it could not have been easy to form a clear conception of what is "a symptom of a symptom," or of "a symptom of a cause." The "symptoms of symptoms" have been defined as "effects which result from the symptoms of a disease, but which are not necessarily allied to the disease," and the following example is given: "thus the debility which results from the frequency of the alvine evacuations in dysentery is a symptom of symptoms." All this has been handed down from the time of Cullen and seemingly accepted without demur or comment on the part of the profession and recorded by such authors as Dunglison, Littré and Robin, and other writers of eminence. From symptoms effects cannot arise, for symptoms are only manifestations of a morbid condition which is itself the effect of a cause. The idea of an effect arising from a manifestation is therefore most irrational. The debility which results from such phenomena as the frequent alvine evacuations in dysentery is a consequence and not a symptom of the dysentery. The outward manifestations of dysentery are the frequent bloody alvine evacuations accompanied by tenesmus. The analysis of these symptoms furnishes a sign upon which to base the diagnosis of the disease.

There are no "symptoms of a cause" any more than there are "symptoms of symptoms." The cause produces an effect—disease—which effect manifests itself by certain general or local symptoms.

Of late years it has been proposed to employ two classifications and nomenclatures, one for the clinician, based upon the characters of the symptoms of disease, and one for the pathologist, to be used in the autopsy room. Such a system would be entirely unnecessary if a single classification and nomenclature were placed upon a proper foundation.

The modern botanical classification is based upon the reproductive organs of plants, that is, upon anatomy.

Zoological classification is likewise based upon anatomical characters, and this basis was adopted to a certain extent by Buffon, notwithstanding his general opposition to methodical arrangement, by Pennant in his history of quadrupeds, published in 1781, and by other zoologists of their time.

Looking at the inorganic world, it will be seen that the classification of minerals is based upon their chemical properties. The system adopted by the mineralogists includes classes, orders, species and varieties.

The chemical nomenclature of the present, the result of more than a century of arduous labor, is based upon the composition of compound substances, so that the name of a chemical compound generally indicates its exact composition.

All systematic studies of those sciences wherein the greatest advances have been made during this century, are established each upon a rational, a substantial basis, except medicine; and why the good example set by the naturalists has not been more generally followed by medical writers, it is not easy to explain.

A nosography based upon sysmptoms cannot be accurate and must necessarily fall.

To be of practical utility, the classification of diseases should be based upon anatomy. This is the answer to the second question.

In this work therefore, an attempt is made to raise the superstructure of nosography upon this foundation.

Dr. Clymer, whose opinion was asked in relation to the question of the basis of classification of diseases, writes as follows:

"The first attempts towards a classification of diseases are, necessarily along the lines of symptoms. They are the objective marks of disorder; the salient signs that compel attention. In an early state of study, with defective knowledge of substance and its properties, they offer the one conception of departure from sound working we can have. True scientific research is bottomed on observation. The unknown cannot be made the subject of positive thought. Cognition is conditioned on experience, which comes through perception; and a right understanding of phenomena must be within the limitations of experiences, and can be studied successfully only by this method.

"When we get to a better knowledge of substance, its forces, and their variations, the artifice classification, based on positive data, becomes possible. It will be more or less perfect in proportion to the degree and fulness of such knowledge. Berkeley says: 'We know a thing when we understand it; and we understand it, when we can interpret, or tell what it signifies.'

"When the square of the hypotheneuse is geometrically demonstrated, no one has a right to his own notion about it.

"Facts of phenomena arise from facts of substance, otherwise they are facts of fancy. Symptoms looked at alone as such and not coupled with the suffering substance whose speech they are, and by which its troubles are told, will misguide or give no hint of the true state of things. Necessitated correlation of matter and force is a primal law. No change in the customary expression of an activity, whether by increase, lessening, arrest or perversion, may happen, without, at like time, a change, coarse or fine, in the plasmode. Hence, as a matter of fact, there can be no such thing as mere functional disorder apart from structural damage. This would be an abstraction, as it supposes a quality without support, which is meaningless and contradictory. We can neither know, or be ignorant of an abstract thing.

"Facts of quantitative or qualitative disturbance, made known by objective or subjective tokens, can, therefore, be only truly expressed in terms of substance."

DESCRIPTION AND DEFINITION.

Summarising what has already been stated as to the scope of nosography, it is found to include: (1,) the description; (2,) the definition; (3,) the nomenclature; and (4,) the classification of diseases.

The description of a disease is the setting forth, in detail, of its cause, nature, pathoanatomy, and symptoms.

The definition of a disease is the statement of its peculiar, dominant, and constant characteristics so concisely and clearly, that it can be readily recognised.

Description and definition are too often confounded. An exact definition is the summary of an accurate description. It takes from such description only what is essential to precisely characterize a disease and distinguish it from any other disease. An exact definition can therefore be deduced from the analysis only of a complete description.

In the description of a disease there may be symptoms and other conditions which are common to two or to more than two diseases. To introduce such characters into a definition would vitiate and render it useless.

The methodical nosographer first describes a morbid condition. From this description he extracts the definition and from the definition obtains the correct name of the disease which he accordingly classifies.

3. WHAT SHOULD BE THE CHARACTER OF THE NOMENCLATURE OF DISEASES?

Nosonomy,* or the nomenclature of diseases is that division of nosography about which there is

* Nosonomy, from νόσος, disease, and ονομα, name. The words know and name are said to be traceable to the same root. Diseases to be properly named should therefore first be well known.

the least agreement among both the ancient and modern authors; consequently, of all scientific nomenclatures, that of medicine is confessedly the most defective. Of the many good rules prescribed for naming diseases, few have been observed, and many of the most absurd and meaningless terms, anciently adopted, are still obstinately retained. A pernicious habit of inaccuracy among writers has been the outcome of this faulty nomenclature which now proves to be one of the greatest detriments to the science and art of medicine. Although repeatedly pointed out, no concerted international action has been taken for the remedy of this evil. The nearest approach to reformation is indicated by the work done, in the past thirty years, by the medical profession of the advanced European nations, more particularly of England. Most of the labor, however, was individual, and performed by the late Doctor William Farr, of London, who is entitled to the highest praise for his devotion to this section of nosography. He has done much to advance nomenclature, but there remains much more of the same kind of work to be accomplished.

Sir W. Aitken, who has also given great attention to the question of nomenclature, summarises "the considerations which have generally regulated the naming of diseases" as follows: "(1,) some names have been taken from the part affected—e. g., peripneumonia, podagra, opthalmia, dysentery; (2,) the most characteristic symptoms have furnished the name—e. g., ileus, tenesmus, paralysis, diarrhoea, dyspnoea, coma; (3,) some names have been taken from these two circumstances combined—e. g., cephalalgia, otalgia, cardialgia, odontalgia, hysteralgia; (4,) an alteration of tissue upon which subsequent changes depend being recognised as the essential element of the disease, it is named accordingly—e. g., pleuritis, peritonitis; (5,) such alteration not being discovered, the first tangible link in the chain of causation has been used instead—e. g., melancholia, cholera, typhus; (6,) when a lesion tending to sudden death at once follows the application of a cause, that cause may name the disease—e. g., lightning, prussic acid, arsenic, scald, sun-stroke, cut, stab, frost-bite, etc.; (7,) a considerable number of names of diseases have been derived from some imaginary resemblance to external objects—e. g., elephantiasis, cancer, polypus, anthrax, etc.; (8,) there are still many names the origin of which it is not easy to trace."

Faulty as are these and many other terms, it is extremely difficult to fill their places with suitable expressions. That this will in time be accomplished—perhaps however not until two or three generations of physicians shall have passed away—is reasonably to be anticipated. Meanwhile it is to be hoped that during the present generation good substitutes will be offered for such caconymous terms as podagra, rheumatism, apoplexy, melancholia, ileus, dysentery, diarrhoea, cholera, typhus and typhoid fevers, variola, diphtheria, hydrophobia, elephantiasis, lupus, leprosy, anthrax, cancer, chancre, chancroid, scrofula, syphilis, and a host of other equally inappropriate names of diseases.

Many of these terms are used in this essay—but under protest—until, by general agreement, correct terms shall be substituted.

"The perfection of a science depends, in no inconsiderable degree, upon the perfection of its language; and the perfection of every language upon its simplicity and precision." *

The language of medicine should be euphonious, simple, expressive, and accurate, for, its object is not only to describe and define diseases with precision, but to mirror the medical experience, wisdom, and genius of the past as well as of the present. Nosographical nomenclature

* John Mason Good.

is the most important part of medical language and consists of the technical terms therein used. This nomenclature should be based upon the structural characters, of the affections of the human body; therefore the names given to diseases should convey to the mind an exact idea of the morbid conditions which these names are designed to express, at least a strong endeavor should be made toward the attainment of that end.* As a general rule these names should be

* "The exactness of names and the uniformity of terms render more facile and prompt the knowledge of a science, and an expressive and characteristic denomination makes a profound impression upon the mind which necessarily puts the object designated into the place of its designation." (Paraphrased from Condillac by Pinel.)

Condilliac in commenting upon nomenclature propounded the following aphorism. "*Les sciences se réduisent à des langues bien faites.*" This may be liberally translated into, sciences may be reduced to exact language.

"It is the exactness and also the good use of words, or more generally of signs, which should be considered as the criterion of the truth; it is to their vague character, to the uncertain and confused manner in which they are employed, that should be attributed imperfect notions, prejudices, errors, and all vicious habits of the mind.

"In nearly all the departments of medicine, the language is ill constructed. It has been more and more corrupted by the false application of words borrowed from the other sciences, Latin or Latinised Greek, or of Greek or Latin derivation but should not be compounded of Latin and Greek. To avoid confusion it is desirable that one name only be adopted for each individual disease. When a disease already bears several names, if one of these be accurate it should be adopted to the exclusion of the superfluous or improper names, otherwise a correct term should be coined, and the other names should be placed under the head of equivalents, synonyms, or caconyms, as the case may be.

The names of men applied to diseases are extremely objectionable, convey no idea of the nature of these diseases, and even fail to flatter vanity. It happens sometimes that a disease bears the names of two persons whose description thereof is the same. May it not also happen that one and the same disease is very differently described by two or even three persons, each giving his name to the disease, so that two or three diseases may be enumerated where only one exists? The resulting confusion and perplexity would, in such a case, be most discouraging to earnest students. The fashion of giving men's

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and by a certain insignificant and ridiculous jargon which has too often been adopted by physicians owing to a culpable respect for popular prejudices." (Cabanis.)

names to diseases has continued through so long a series of years that it has grown into a confirmed and mischievous habit. If this sentimental, but mistaken, notion of honoring or of rewarding merit could have been limited, no great harm would have ensued. The evil is however already an offensive blot upon the nomenclature of medicine, and threatens to mar the best pages of medical literature. Will it not be a most agreeable relief to the senses of the heedful reader when authors shall have banished from their treatises such terms as Addison's disease, Basedow's disease, Bright's disease, Charcot's disease, Duchenne's disease, Dupuytren's contraction, Graves' disease, Hodgkins' disease, Ménière's disease, Pott's disease, and very many more of kindred names which express no notion of the nature of the affections bearing such pseudonyms?

The names of regions of country—e. g., Barbadoes leg; of animals—e. g., lupus, elephantiasis; of vegetables—e. g., hay fever; of some of the elements—e. g., St. Anthony's fire; and other names too absurd and too numerous to particularise have been given to diseases.

The same faulty nomenclature exists in the fundamental science and associated arts of medicine.

It is to be hoped that the much desired general reformation in medical nomenclature will soon begin, but the bad foundation must first be sapped by a radical change in the nomenclature of the fundamental science and associated arts of medicine.

The answer to the third question is that the nomenclature of diseases, to be exact, should be based upon the true nature of morbid conditions and should be characterized by simplicity, brevity and accuracy.

Inasmuch as many of the words employed by the earliest nosographers are now largely used, and inasmuch as their use will probably be continued for a long time, it is proper that the intention of their coinage be clearly understood. Doctor John Mason Good's nosology contains a full explanation of many of the terms employed by Sauvages and other contemporaneous nosographers, and also a table of some of the medical prefixes and terminals with a brief statement of the senses in which they are applied. This table of prefixes and terminals is here reproduced for the benefit of those who may desire to know their exact meaning as understood when they were coined.

GOOD'S TABLE OF PREFIXES AND TERMINALS WITH THE SENSES IN WHICH THEY ARE USED.*

Prefixes.

A, (α), Diminution or less quality or power.

Apo, ap, aph, (απο, απ, αφ), Cata, cat, (κατα, κατ),	For the most part iterative, duplicate, or augmented action: but often indeterminate.

Dia, (δια), Separation; secernment; or secretion.

Dys, (δυς), Morbid state or action generally, emphatical, when accompanied with distress or difficulty.

Ec, ex, (εκ, εξ), Epi, ep, eph, (επι, επ, εφ), Hyper, (ὑπερ),	Out of; outwards; over; above.

Hypo, (ὑπο), Under.

En, (εν), Within; below; applied to places. Superiority; excess or intensity; applied to quantity or quality.

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* A more extended table of prefixes and terminals is to be found at the end of Volume I, of Piorry's "*Traté de Médecine Pratique et de Pathologie Iatrique ou Médicale. Généralités.*" 1841.

Para, (παρα), Morbid state or action generally; and hence synonymous with *dys*; except in a few terms derived from anatomy, in which it imports *apud*, "bordering on," as in parotitis, paronychia.

Peri, (περι), Circuit; circumference.

Terminals.

Algia, (αλγια), Pain or ache.

Asmus, osmus, (ασμα, οσμος)
Esmus, ismus, (εσμος, ισμος),
Esis, osis, (εσις, ωσις),
Morbid action, power, or possession generally; but mostly very indeterminate.

Iasis, (ιασις), Cutaneous eruption, unconnected with fever as its cause.

Itis, (ιτης), Organic inflammation.

Kele, cele, (κηλη), Covered protrusion of a soft part.

Odes, (ωδης), Like; akin to.

Oma, (ωμα), External protuberance.

Ptoma, (πτωμα), Naked prolapse of a soft part.

Rhoea, (ροια), Preternatural flux of any fluid except blood.

Rhagia, (ραγια), Preternational flux of blood.

Latin terminals.

Igo, Diffuse or migratory action or motion.

Illa, ula, / Illaris, ularis, } Simple diminutive terminations.

Osus, Simple augmentive termination.

4. WHAT SHOULD BE THE METHOD OF THE CLASSIFICATION OF DISEASES?

Nosotaxy or the classification of diseases.—The fourth division of nosography relates to the grouping of those diseases that have been described, defined, and named, and to their arrangement into distinct classes, orders, genera, and species. This is called taxonomy * or classification.

Next to nomenclature, classification has exhibited the most diversified and incongruous views. At the close of the last, and in the beginning of this century, classification was in such fashion that every prominent physician thought himself bound to construct a new classfication of diseases. The result was that no two systems agreed ; and that nearly all classifiers not only repeated the

* Taxonomy, from τάξις, arrangement, and νόμος, a law; and, for the sake precision and brevity, nosotaxy, the classification of diseases.

heresies of their predecessors, but often made greater mistakes, so that nosography soon fell into disrepute and contempt. The excessive zeal displayed by many of these classifiers in endeavoring to promote nosography, and their premature publication of imperfect and ill digested systems, are among the main causes of the retardation of its progress.

Sir W. Aitken, in his warm advocacy of methical arrangement, predicts a glorious future for nosography.

He says, under the head "principles of classification":

"A perfectly philosophical or natural system of classification aims at having the details of its plan to agree in every respect with the facts as they exist in nature, and to be as it were a 'translation of the thoughts of the Creator into the language of man.' To effect this end, arrangements, as they naturally exist, require to be traced out, not devised. The tracts in which our knowledge is as yet deficient, may be shortly indicated under the following heads: (1,) the affinities or alliances of diseases with each other; (2,) the morbid anatomy of diseased parts; (3,) the communication, propagation, inoculation, generation, development, course, and spontaneous natural termination of diseases; (4,) the connection of the phenomena recognised during life with the facts of morbid anatomy; (5,) the geographical distribution of diseases; (6,) the succession of diseases, so far as they can be traced through past ages; the peculiarities they have exhibited at different periods in the world's history, or within comparatively recent cycles of years. "But," he further says, "the time has not yet come for a classification on a basis so comprehensive—simply because the material does not yet exist; and attempts to make so-called natural systems of arrangement must end in disappointment, on account of the uncertain and fluctuating data on which they must be based."

It is true that the whole of the material does not yet, and may never, exist for "a perfectly philosophical or natural system of classification," but there is enough good material at hand, which, if wisely used, will greatly improve the present systems of classification. It surely is not the part of wisdom to wait an indefinite time to begin this work. Had the early nosographers waited for the "proper time to come," this science would, to-day, scarcely be in existence. But they quickly made use of such material as was then at hand and their labors have led largely to the advances which are at present enjoyed.

The succeeding generations of nosographers wil doubtless profit by the good work—and by the errors too—of the preceding, and it may possibly be many centuries before the fond hope of Sir W. Aitken can be realised, but the beginning should be made now.

The task of improving the classification of diseases may be begun by individuals, but individual labor should, with good grace, be submitted to the criticism and correction of other individuals and of organized associations of the medical profession, first of the country of these individuals, then of all countries of the world.

The study of the nosography of the past, showing, as it does, such great diversity in the many systems, such lack of agreement among the nosographers, such confusion in classification, and such eccentricity in nomenclature, must needs lead to the conclusion that it is not possible, in the existing state of medical science, for any one person, or for a single association, or even for the medical profession of one or of several nations to produce a complete general nosography. The unsuccessful efforts already made in this direction for the past century and a half are good evidences of the correctness of this proposition. Many individuals may each prepare the nosography of one apparatus of the human body and thus doubtless give substantial aid in the cause of nosography and contribute thereto much valuable material; but, in view of the progressive character of medical science, the details of all such work must necessarily be provisional and constantly subjected to alterations and revisions. The final decision of questions relating to the general principles of nosography, and tending to make the nomenclature of medicine uniform in all countries, should be made by an assembly of representant physicians of all nations, through international conferences, so that every individual member of the medical profession may know that his voice shall be heard for or against the adoption of any proposed method of nomenclature and classification of the diseases of man. By this means only can a comprehensive system of nosography be compiled which will be of practical utility to all nations for the purposes of vital statistics and of the medical reports of armies, navies, and general hospitals, or for the use of students, teachers and investigators.

The answer to the fourth question is that the excellent method of classification, borrowed from the botanists, by the early medical classifiers, should be re-adopted with the modifications indicated below.

If the majority of the medical profession of the world should decide in favor of classifying the diseases of the human body, as heretofore, like systems of botany, it would seem rational to base the classification upon anatomy in its broadest sense; and such a basis is the one which offers the greatest advantages and the widest scope in theory and in practice. A knowledge of the gross appearances and of the construction and relations of the several parts of the body; of the minute structure of the tissues and organs; of the development and abnormities of the organs; of the functions of the apparatuses; and of the nature of morbid conditions, is of the utmost importance. Nay more, a mastery of these various branches of anatomy is essential to the study of the natural history of diseases. By its aid, all deviations from the normal state of the body or any part thereof are at once recognised. It remains only to differentiate these abnormal conditions and to define, name, and classify them. These, it seems, are sufficient grounds for the adoption of the anatomical basis for the nosography of man. It is therefore suggested that all diseases, injuries, and congenital abnormities be grouped into families, one family for each apparatus of the body, and one or more than one family for general diseases. Some of the families should have two or more than two branches, and families and their branches should be divided into classes, orders, genera, species, sub-species, varieties and sub-varieties.

It is of the utmost importance that, in the medical profession, there be a consense of views concerning not only nomenclature and methodical arrangement but also the use of the terms of classification. Notwithstanding the fact that the early nosographers indicated, as best suited to the purposes of nosography, the simple arrangement of diseases into classes, orders, genera, species, and varieties, the most recent of the modern medical classifiers begins with classes and after orders introduces "sub-orders, tribes, and families," next to which he places genera, species, and varieties. Such a method only leads to confusion, complication, and uncertainty. Similar methods have been tried in medicine and found wanting in clearness and accuracy.

The plan proposed in this work does not include sub-orders, or tribes. Families are applied to the groups of diseases dwelling in the apparatuses of the body.

The nosographer who lays before the profession a system of classification is in duty bound to give an exact definition of each and every term of classification which he employs, in order that he may be rightly understood.

Only those terms of classification that are approved by the medical profession should be used in a special or in a general nosography.

The sooner the question of method is put to a vote, after free discussion in an association representing the medical profession of the whole world, the better it will be for the cause of accurate nomenclature and classification.

Therefore the following questions are suggested for discussion at the Tenth International Medical Congress.

1. Shall there be instituted an International system of nomenclature and classification of the diseases of man?

2. If so, what shall be the basis of this nomenclature and classification?

3. What shall be the character of the nomenclature?

4. What shall be the method of the classification?

5. What shall be the nature of the terms used in the classification?

6. Shall these terms be defined?

In case the first question—shall there be instituted an international system of nomenclature and classification of the diseases of man?—be decided in the affirmative, it is further suggested:

1. That the International Medical Congress establish a permanent section on the nomenclature and classification of the diseases of man, to be composed of physicians and surgeons representing the medical profession of all nations.

2. That all national medical associations likewise establish each a section on the nomenclature and classification of diseases, composed of physicians and surgeous representing different regions of country, in order that their knowledge of the peculiarities presented by disease in differing climates may be made available in the work to be accomplished.

3. That state, city, and special medical associations, through their presiding officers, each appoint a committee on the nomenclature and classification of diseases.—This can be effected without, in any way, deranging the machinery of these associations.

4. That the city and special associations report to the State Associations such action as they may take upon the proceedings of their committees.

5. That the reports of the city and special associations be embodied in the report of the

State committee, and the consolidated reports be presented to the State Association for action and transmission to the national association.

6. That the national association refer the state report to the national section on nomenclature, etc., for a report after careful examination and free discussion. The report to be acted upon by the National Association and forwarded, or presented by a delegate, to the section on nomenclature and classification of the International Medical Congress.

7. That the section on nomenclature and classification of the International Medical Congress then revise the several national reports, consolidate them, and present their conclusions to the Congress whose decision thereon should be final.

These suggestions are made in the belief that they point to a fair method of obtaining the views and the vote of the whole medical profession on a subject of the vastest importance to mankind, and also to the most expeditious way to attain the desired end of compiling a uniform nomenclature and classification of diseases that may be of practical utility to all nations.

DEFINITIONS OF THE TERMS OF CLASSIFICATION.

The following definitions of the terms of classification are modeled upon botanical nomenclature, except those of family, class, and order, which do not here occupy the same relative positions as in works on Botany and Zoology.

1. *Families of diseases.**—A family is a group of diseases dwelling in an apparatus of the human body and affecting, in a greater or less degree, the organs of this apparatus and consequently its function. Therefore affections of the organs of an apparatus, and also general diseases affecting several apparatuses at once, should be grouped into families.

2. *Branches of families.*—A branch of a family of diseases is a division of the family predicated upon affections peculiar to sex; as in the case of the family of affections of the uro-genital apparatus which should be divided into two branches, (1,) andrology, (2,) gynaecology; or upon the

* Family,—from *familia*, a family, and *famulus*, a servant, and *δμιλια*, an assembly, and the Hebrew word which means to labor,—is the most general term, being those who are bound together upon the principle of dependence.

Family includes in it every circumstance of connexion and relationship. (Crabb.)

affections of an apparatus which includes two, or more than two subsidiary apparatuses, as in the cases of the cephalo-rhachidian, nutritive, and cutaneous apparatuses.

3. *Classes.**—A class of diseases is ordinarily defined as a division of diseases grouped together on account of their common characteristics. In this case, however, the term class is used to signify a group of diseases which, though possessing different characteristics, affect a particular organ. In this system, therefore, the classes have reference to, and bear the anatomical denomination of, the organs of an appparatus.

4. *Orders.*†—An order is an association of genera or a group of the general morbid conditions of allied affections of particular organs. The orders, therefore, refer to the general de-

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* Class, from *classis* very probably from the Greek *κλάσις*, a fraction, division, or class. Class is more general than order. "Classification is a branch of philosophy which is not attainable by art only, it requires a mind peculiarly methodical by nature, that is capable of distinguishing things by their generic and specific differences; not separating things that are alike; nor blending things that are different." (Crabb.)

† Order, from *ordo*, from *ὄρχος*, a row, which is a species of order, is applied to everything which is disposed. The order lies in consulting the time, the place and the object, so as to make them accord. (Crabb.)

nomination of the morbid condition of the organs of an apparatus.

5. *Genera.**—A genus is an assemblage of species possessing certain characters in common. The genera, therefore, refer to the particular denomination of the morbid condition of the organs of an apparatus.

A single species having distinctive characters that seem of more than specific value may constitute a genus.

6. *Species.*†—A species is a permanent series of similar individual affections associated on account of their common properties. These properties are to be determined only by the closest observation of abnormal conditions of the human body. Species, says Cullen, "are ready made by nature" (he would have been more exact had he said, the individual diseases which constitute species are ready made by nature); the nosog-

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* Genus, from *gignere*, from γένειν, to engender, "is a class of objects divided into several subordinate species." (Webster.)

† Species, from *spicere*, to behold, signifies literally the form or appearance, and in an extended sense that which comes under a particular form. Species is a term used by philosophers, classing things according to their external or internal properties." (Crabb.)

rapher has only to discover and name them, but the orders and genera he must construct—not according to fancy, but to reason and to definite rules. Species are therefore named in accordance with the general specific properties of the affections of the organs of an apparatus.

7. *Sub-species.*—A sub-species is a subordinate species, possessing distinctive characters that are of more specific value than those of a variety. On this account it occupies a middle position between the species and the variety.

8. *Varieties.**—A variety is a form of species possessing peculiarities that differentiate it from the typical characteristics of the species. The varieties are therefore named in accordance with the particular specific properties of the affections of the organs of an apparatus.

9. *Sub-varieties.*—A sub-variety is a subordinate variety or a division of a variety. It may indicate morbid properties differing in their characteristics from those typical of varieties, or may

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* Variety, from *varius* which probably comes from *varus* a speck or speckle, because this is the best emblem of variety. Variety seems to lie in the things themselves. A variety cannot exist without an assemblage. Variety strikes on the mind, and pleases the imagination with many agreeable images; it is opposed to dull *uniformity*." (Crabb.)

indicate the special cause of the affection. The sub-varieties, therefore, relate partly to the special character and partly to the aetiology of the affections of the organs of an apparatus.

10. *Symptoms.**—A symptom is a manifestation of disease. It is perceptible to the senses, even of the patient.

11. *Signs.*—The sign of a disease is the indication of its presence. It may be (1,) a sign *per se*, indicating disease apart from symptoms, or (2,) an inferential sign deduced from the analysis of a symptom or of a group of symptoms.

The symptoms and signs, without which accurate classification would be impossible, serve to detect individual diseases and establish species, and from the species the classification is constructed, for out of them spring the genera and the orders, the varieties and the sub-varieties. Therefore the position of symptoms and signs is next in order to the fundation stone of nosography.

Symptoms of diseases, being their manifestations or those phenomena which are apparent to the senses of the observer or even of the patient,

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* Symptom, from *συν*, with, and *πιπτειν*, to fall. To fall in with. Any perceptible change in the human body.

differ very materially from the signs, these being deduced from the analysis of the symptoms. Therefore the symptoms are noticeable by anybody, but unless rightly interpreted are generally of little value. It is only the wise and experienced physician, after analyzing a group of symptoms and properly interpreting them, who can perceive what is correctly termed the sign of a disease.*

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* The following note is paraphrased from Double's "*Semeiologie Générale.* A collection of symptoms properly analyzed becomes the sign of a disease. The sign is a conclusion which the mind draws from the symptoms thus analyzed. Therefore the sign belongs to the understanding and the symptom to the senses. The sign of a disease may exist without symptoms. It is said by Fernel that all symptoms are signs but that all signs are not symptoms. Symptoms are observed only in disease, but there are signs which belong to health. It is not generally said that a man shows symptoms of health, but that he shows *signs* of health.

SECTION V.

REVIEW OF THE MORBID STATES AND MORBIFIC PROCESSES. THE BACTERIA, PTOMAINES, LEUCOMAINES, AND EXTRACTIVES.

Analysis of some of the terms used in general pathology and of those contained in the synopsis of morbid states and morbific processes, together with remarks on these states and processes. Summary of the present state of knowledge of the bacteria, ptomaines, leucomaines, and "extractives." The relations borne, to medicine and surgery, by these microörganisms and alkaloids of putridity. Classifications of the bacteria, ptomaines and leucomaines. Uniformity in their nomenclature and classification much needed. Remarks on the neoplasms and on their classification.

As already stated, the synopsis of morbid states and morbific processes is intended as a suggestion of a ground-work for the classification of diseases, but inasmuch as new terms are therein proffered, and changes, tending to greater precision, made in many of those that are in general use, some explanation is due respecting the nature of the new words and the foundation of the changes in the old terms. Therefore most of the terms contained in the synopsis will now be defined, analyzed and, as far as practicable, reasons given for their introduction.

In this attempt to correct defective words and to coin new terms, prefixes and terminals which are in general use will be employed, such as *hyper* which signifies over, above, excess, and will be applied in the sense of increase, and *hypo* which signifies under, below, and will be applied in the sense of decrease. The terminal *aemia*, from *αι'μα*, blood, will be employed in preference to *osis* so often improperly used in that connection. The middle section of each term compounded of three roots will also be explained and its etymology given in a foot note.

I. ALTERATIONS IN THE QUANTITY, QUALITY, AND COMPOSITION OF THE BLOOD.

1. Hyperaemia* is here used in its strict signification of a superabundance of blood, an increase of its whole quantity in the body, and is offered to replace "*plethora vera*," polyaemia, and hyperaematosis. Hyperaemia has often been wrongly employed to signify local congestion or the accumulation of blood in the capillary vessels, or even inflammation. In the Lexicon of Medicine, etc., of the New Sydenham Society, London 1886, hyperaemia is defined as

* *ὑπὲρ*, over, above, excess, and *αι'μα*, blood. Above the normal amount of blood.

"an excessive amount of blood in the vessels of a part; a local overfilling of the blood-vessels, so that they are distended with blood and give more or less increased redness to the part, with some swelling. When hyperaemia continues there may be oedema of the part from effusion of serum, or there may be haemorrhage." There is nothing in this definition, or rather description, to indicate general overplus of blood. It is, in reality, a definition of congestion whose proper place is under the caption of disturbances in the circulatory apparatus.

2. Hypoaemia,* meaning an insufficiency of blood, a decrease of its whole quantity in the body, is introduced in place of anaemia which literally signifies absence of blood. The intention in the coinage of the word anaemia was to express the idea of a lessening of the red blood cells, and it has failed to do so. The privative *alpha* in this, and in many other words to which it is affixed, leading to misconception of the condition intended to be designated. Therefore all words so prefixed should be rejected, except where the *a* is absolutely needed, as in *atrophy*, when cessation of nutrition is intended to be ex-

* From ὑπό, under, beneath, below, and αἷμα, blood. Below the normal amount of blood.

pressed, and in local anaemia when there is literally no blood in the capillary vessels of a part; e. g., local capillary *anaemia* caused by ischaemia arising from constriction of the capillaries, the plugging of a neighboring arteriole, etc.

The term hypoaemia was formerly used to indicate the presence of blood in the anterior chamber of the eye, although there is not a syllable in this word to show that it has reference to the eye. Hypoaemia was also used synonymously with ecchymosis, *sugillatio.* "Anaemia, used (*by the French*) synonymously with oligaemia, is a want, or deficiency of blood; the condition of the body after great loss of blood; exsanguinity. There may either be a defect in the total quantity of blood, as occurs for a short time, perhaps, after profuse haemorrhages, or a diminution in the relative amount of red corpuscles as compared with the other constituents of the fluid, as in chlorosis." *

This mixed definition, not of anaemia, but of hypoaemia, hypoerythrocythaemia, hyperhydraemia and hypohydraemia, is very confused and confusing.

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* Lexicon of Medicine, etc. New Sydenham Society.

3. Hyperhydraemia* signifies *increase* of blood-water which is not indicated by the commonly used word hydraemia whose meaning is simply blood-water, although it has been defined, by high authorities, "as a watery condition of the blood depending on defect of albumen and fibrin, or on retention of water from arrest of the cutaneous or renal secretions."

Hyperhydraemia is the outcome, of profuse haemorrhage, exhausting diseases, or starvation.

4. Hypohydraemia signifies *decrease* of blood-water, and is the outcome of those diseases in which much water is consumed in, or discharged from, the body, as in cholera, erysipelas, acute articular rheumatism, puerperal fever, typhus and typhoid fevers, conditions producing polyuria, etc.

To express the idea of deficiency of serum in the blood, Piorry adopted the term anhydraemia which means absence of blood-water and is therefore inexact.

5. Hyperinosaemia† signifies *increase* in the tendency to the formation of blood-fibrin, while hyperinosis indicates "over activity of muscular fibre." The term hyperinosis was suggested by

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* ὕδωρ, water.

† ὑπέρ, excess, ἴς, ἰνός, muscle, fibre, and αἷμα, blood.

F. Simon to express the idea of "excess of fibrin in the blood; such as occurs in acute rheumatism and in erysipelas, when it may amount to upwards of one per cent." But this, like many other imperfectly constructed terms, fails to convey the intended idea, unless the final *is* be replaced by *aemia*,

6. Hypoinosaemia signifies decrease in the tendency to the formation of blood-fibrin. Flint* uses the term hypinosis to signify imperfect coagulation of the blood, but it really means decreased activity of muscular fibre.

Hypoinosaemia appears to be the more exact term. "It has been observed in some acute infectious diseases, in acute icterus, in death from asphyxia, and in death from certain poisons, such as sulphuretted hydrogen and hydrocyanic acid."

7. Hyperleucontaemia signifies increase of blood-albumen.† There being no Greek word for albumen, the term leucontaemia is offered to signify blood-albumen, from *λευκόν*, white of egg, which is albumen.

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* A. Flint, Principles and Practice of Medicine. 1886.

† The substance formerly called albumen of the blood is in reality serine and metalbumen. (*Flint's Physiology.*)

8. Hypoleucontaemia signifies decrease of blood-albumen. Hypoalbuminosis, a hybrid word and therefore inadmissible, has been used to designate a deficiency of albumen in the blood. A condition existing in starvation or after a copious haemorrhage.

9. Hyperalonaemia * signifies increase of blood-salts.

10. Hypoalonaemia signifies decrease of blood-salts. These alterations in the quantity of the saline elements of the blood play an important part in diseases.

11. Hyperchromataemia † signifies increase of blood-color. The coloring matter of the red corpuscles of the blood is called haemaglobine which is a hybrid word. It is sometimes diffused in the blood owing to disintegration of the red corpuscles, and thus the blood is increased in color. The term haemoglobinaemia is used to designate this condition, but its composition renders it hybrid as well as tautological. It is taken from *αι'μα*, blood, *globulus*, globule, and the terminal *αι'μα*, blood. Hyperchromataemia seems to indicate clearly an increase in the blood-color. It

* *ὑπέρ*, increase, *αλς*, *αλων* (genitive plural), salt salts, and *αι'μα*, blood.

† *χρῶμα*, color.

is for the pathoanatomist and clinician to determine and interpret its causes and effects.

12. Hypochromataemia signifies decrease of blood-color. As there is increase, so, in all probability, many circumstances arise to cause a decrease in the color of the blood.

13. Hyperleucocythaemia signifies increase of white blood-cells. Leucocythaemia * is the term ordinarily used, but it only means white blood-cells, and expresses a normal condition. The other terms, leucocytosis and lukaemia, suggested by Virchow are quite as indefinite; the latter meaning white blood, which is lymph. This eminent pathoanatomist adopts the word leucocytosis to express the idea of a temporary increase in the number of white corpuscles, but the term entirely fails to convey such an idea. In the case of a great and permanent increase of white blood-cells he uses leucocythaemia or lukaemia, both equally misleading.

In hyperleucocythaemia, the red blood-cells are generally decreased in number, so that the two conditions hyperleucocythaemia and hypoerythrocythaemia occur in conjunction.

Hypoxanthine has been found in considerable

* *λευκός*, white, *κύστις*, pouch, bag,—cell.

quantity in cases of hyperleucocythaemia. (Gamgee,)

14. Hypoleucocythaemia signifies decrease of white blood-cells.

15. Hypererythrocythaemia * signifies increase of red blood-cells. Plethora,† plerosis,—meaning repletion, and intended to mean a superabundance of blood in the system but failing to do so; hence the division of plethora into general and local,—hyperaemia, polyaemia, polycythaemia, polyhyperaemia (!), angioplerosis, erythraemia (red blood), have all been used, improperly of course, to designate increase of red blood-cells.

16. Hypoerythrocythaemia signifies decrease of red blood-cells. Anaemia is generally, and improperly, used to express this condition. Anaemia literally means absence of blood, and should be restricted to the expression of the idea of local absence of blood,—local anaemia,—such as occurs in ischaemia which may be a temporary or a permanent arrest of blood in a part, the latter arising from constriction of the capillaries, from plugging of a neighboring arteriole, or from some other cause.

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* *ἐρυθρός*, red.

† Plethora, from *πλῆθος*, a great number.

17. Hyperlipaemia signifies increase of blood-fat, and is generally called lipaemia (blood-fat), a normal condition which is very variable in the blood-plasma. It increases after the ingestion of fatty substances until the blood may acquire a milky appearance. Fat has been known to increase in the blood of diabetics, in certain affections of the liver, in phthisis, in chronic alcoholism, and in fat embolism.

18. Hypolipaemia signifies decrease of blood-fat.

19. Hyperphysaemia signifies increase of blood-gas. The gases which exist normally in the blood are carbon dioxyde, oxygen, and nitrogen, either in solution, or in combination with organic or inorganic compounds. Their increase gives rise to abnormal states which will not here be discussed. The reader is therefore referred for further information on this interesting subject to Paul Bert's experiments, and to works on general pathology in which are found articles on the effects of high atmospheric pressure, air embolism, etc.

20. Hypophysaemia signifies decrease of blood-gas. The ill effects of this condition are fully treated of in the works to which allusion has been made above. But a word may be said in

reference to the effects of rarefaction of the atmosphere on the respiration and on the blood, such as are felt during the ascent of high mountains. The name of the "mountain disease or anoxyaemia" has been given to the condition of individuals who, thus breathing an insufficient amount of oxygen, take more but shorter inspirations than normally, suffer head-ache, epistaxis and other haemorrhages, and are soon overcome by fatigue, cold, sleep, and in some cases by death. The same phenomena occur during baloon ascensions. A notable instance is recorded by Tissandier, sole survivor of three who had ascended to a great height in the baloon Zenith.* Jourdanet has published an interesting work, in two volumes, upon the influence of atmospheric pressure on the life of man, based upon a long experience and many observations made principally in Mexico.†

21. Hyperglycaemia signifies increase of blood-sugar. Glycaemia, blood-sugar, is a normal condition. It is only when the sugar exceeds in amount two parts and a half in one thousand of blood that it causes any disturbance.. It then

* Académie des Sciences 25 Avril 1875, La relation de M. G. Tissandier, seul survivant.

† Sur l'influence de la pression de l'air sur la vie de l'homme. Paris 1875.

shows itself in the urine and constitutes what is known as glycosuria. It arises from the disassimilation of certain alimentary substances.

22. Hypoglycaemia signifies decrease of blood-sugar.

23. Acetonaemia signifies acetone in the blood. That acetone is found in the blood in connection with disease is not doubted, but its exact import is still unsettled. On the other hand it has been asserted that "acetone is a normal product of tissue metamorphosis."

24. Ammoniaemia signifies ammonia in the blood. Ammonium carbonate is formed in stagnant, decomposed urine in the pelves of the kidneys or in the bladder, and absorbed and carried into the circulation, or may be absorbed from the intestines. In cases of stagnation of urine in the bladder, a bacterial ferment is said to have been discovered which possesses the property of converting urea into ammonium carbonate.

This ferment is often introduced from without through the use of unclean catheters.

"It was suggested by Frierichs, in 1852, that uraemic phenomena are due to the conversion of urea into ammonium carbonate in the blood, but there is no ground for believing that such conversion actually occurs during life." (Gamgee.)

25. Hyperuraemia signifies increase of blood-urea. Uraemia means blood-urea, but it is generally used in the sense of accumulation in the blood of the elements of the urine. May not the group of phenomena called urinary intoxication be due to the accumulation in the blood, of acetone together with ammonium carbonate, urea, and other deleterious excrementitious substances, such as the "extractives"?

In an experimental study of the poisonous properties of the urine of different animals, Charrin concludes "that the urea is not the toxic agent of the urine."

Hyperuraemia indicates the increase of a normal constituent of the blood (urea).

26. Hypouraemia signifies decrease of blood-urea.

27. Hyperuricaemia signifies increase of blood-uric acid. Flint first suggested the term uricaemia which simply means blood-uric acid, and Murchison adopted the word lithaemia (from λίθος, stone), stone in the blood, meaning uric acid in the blood which is a normal condition.

A great increase of uric acid in the blood has been observed by Garrod in the disease called gout.

28. Hypouricaemia signifies decrease of blood-uric acid.

29. Cholaemia signifies bile in the blood. In morbid conditions where the exit of the bile from the liver is impeded, the bile is absorbed by the lymphatics and carried into the circulation. The constituents of the bile creating certain toxic effects, and the bilirubin staining most of the tissues of the body and producing the condition known as icterus or jaundice.

30. Hypercholesteraemia signifies increase of blood-cholesterin. Flint jr. asserted, in 1862, "that the cholesterin of bile is a result of an excretory function of the liver not previously recognised, and that it is an excrementitious principle derived chiefly from the disassimilation of nervous tissue," and has given the name of cholesteraemia to the accumulation of cholesterin in the blood. He attributes grave toxic effects to such accumulation. Up to the present date Doctor Flint holds the same opinion on this subject. Some of the French, English and German writers take issue with Doctor Flint in his view that hypercholesteraemia is capable of producing the toxic effects attributed to "grave-jaundice."

31. Hypocholesteraemia signifies decrease of blood-cholesterin.

32. Melanaemia signifies black pigment in the blood. The different views respecting the production of this condition will not here be discussed. The reader is therefore referred to works on general pathology.*

33. Septicaemia † signifies putrid infection of the blood. This is due to infection of the blood with the poisons of putrefied animal substances. These animal poisons are now known to be alkaloidal, and are named ptomaines, from *πτωμα*, cadaver, and *ί'ν*, in, *έν*, within, opposed, to *έ'κ* without. The terminal in, or ine, is ordinarily employed by chemists to designate alcaloids. There is nothing in this etymology to denote an alkaloid, therefore ptomaine is not a word of precision.‡

The ptomaines may be evolved in severely injured parts of the human body followed by rapid decomposition, before suppuration takes place, or in blood effused in the great cavities of the

* There are other changes in the constituents of the blood, but they are not sufficiently well known to be here considered.

† From *σηπτος*, putrid, and *αι'μα*, blood.

‡ Selmi derives ptomaine "from *πτωμα*, a carcase, a dead body, and *ινο*, denoting material; or in, from the Latin inus, belonging to." But *ινο* does not seem to mean material, and even if it should have such a signification, material is too obscure to designate alkaloid.

body such as the pleura or peritoneum, or may be ingested with food, and thus be absorbed and infect the blood.

They are called ptomaines because of their original discovery in putrid cadavers.

As some of the readers of this work may desire to study the subject more extendedly than it can be here presented, only a brief account, with some references, will be given of the discovery of ptomaines, and of the investigations, of their nature, toxic properties, and mode of development, now going on in Europe and America.

Discovery, in medicine, is generally slow and gradual, and results from the labors of many men. The first discoverer may only observe the effect, another finds the cause, still another discovers the generic substance and perhaps its properties, then investigators arise who discover species and varieties, and finally come those practical men who are able to interpret the phenomena directly or indirectly connected with them and from their analysis of these phenomena deduce the remedial means to be taken.

*Ptomaines.**—The history of the discovery of

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* Doctor A. M. Brown defines a ptomaine, "considered from a purely chemical point of view, as the cyclical nucleus of a proteid molecule that has undergone complete destruction in the process of putrefaction."

ptomaines is a notable illustration of the foregoing statement. In 1822 Gaspard, and in 1856, Professor Panum, of Copenhagen, found putrid substances to contain active poisons the nature of which they could not ascertain. In 1868, Bergmann and Schmiedeberg believed that they found in contaminated blood a crystallizable nitrogenous substance, which they called sepsine and which they had found in putrid yeast. Their discovery was contested. In 1869, Zeulzer and Sonnenschein are said to have obtained from putrescent animal matter an alkaloid having the properties of atropia. Rosch and Fassbender also found, in putrescent animal matter, an amorphous salt giving reactions similar to those of digitaline. Dupré and Bence Jones extracted, from the liver, a salt, giving the fluorescence of sulphate of quinia, which they named animal chinoidine.

Professor Armand Gautier, of Paris, found, in 1872, that, while undergoing putrefaction, the fibrin of the blood gave a small quantity of complex alkaloids, fixed and volatile. The late Professor Selmi, of Bologna (1870, –75, –78, –80) arrived at similar results in his experiments with putrefied human tissues, and announced that under these conditions, toxic organic alkalies, analogous to vegetable alkalies, were formed. Since then these substances have been studied, especially by Gianetti and Corona (1880), Brouardel and Boutmy (1881), Bouchard (1882–3), Gautier and Etard (1886), and Brieger (1886).

Nencki (1876) appears to have been the first to indicate the chemical formula of a ptomaine.

Gautier divides the animal alkaloids into two distinct groups, *ptomaines* and *leucomaines*.* The first are the products of organic matter in putrefaction, the second, of the living organism in health and in disease.

Ptomaines vary in different phases of putrefaction. Brieger has found successively in the dead human body; *choline*, *neuridine*, *cadaverine*, *putrescine*, *trimethylamine*, and *mydaleine*. Besides the above, Gautier enumerates the following ptomaines; *parvoline*, *hydrocollidine*, *collidine*, and *saprine*.

These alkaloids are evolved through microbic fermentation generally after death; but are more or less toxic when ingested with food.

In a recent article, Professor Vaughan, of the University of Michigan, divides the ptomaines into two classes; (1,) those containing oxygen: (2,) those containing no oxygen. "Among the

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* Gautier gave to the alkaloids of the human organism the name of leucomaines "to indicate their albumenoid origin."

most important members of the second class are the following:

1. "*Collidine*—$C_8 H_{11} N$, discovered by Nencki in 1876, in gelatine allowed to putrefy with infusion of pancreas.

2. "*Parvoline*—$C_9 H_{13} N$, discovered by Gautier in 1881, as a product of the putrefaction of fish. Parvoline is an oily base, of amber color and boils at 200° C. It is slowly soluble in water, freely soluble in ether, alcohol and chloroform.

3. "*Hydrocollidine*—$C_8 H_{13} N$, discovered by Gautier and Etard in 1882, also from putrid fish. It is an oily liquid, boiling at 210° C. It is very poisonous, seven milligrammes being sufficient to kill a pigeon. Death is preceded by nervous excitement and tetanic convulsions.

4. "*Base*—$C_{17} H_{38} N_4$, discovered by Gautier and Etard in 1882. It is not poisonous.

5. "*Base*—$C_{10} H_1 N$, discovered by Guareschi and Mosso in 1883, in putrid beef. It is not poisonous, or is so only in very large quantity.

6. "*Neuridine*—$C_5 H_{14} N_2$, discovered by Brieger in 1884. It is wholly inert, and its importance depends upon its presence in nearly all putrid matter and upon the fact that it gives all

the general alkaloidal reactions, and for this reason may be mistaken for some vegetable poison by the toxicologist.

7. " *Tyrotoxicon**—C_6 H_5 N_2, discovered by Vaughan in 1885, in poisonous cheese, and found by himself and others later in milk, ice cream, custard, cream puffs, etc. This is a highly poisonous body, producing nausea, vomiting, collapse and death.

8. " *Cadaverine*—C_5 H_{16} N_2, discovered by Brieger in the cadaver. It is inert.

9. " *Putrescine*—C_4 H_{12} N_2, also discovered by Brieger, is not poisonous.

10. " *Mydaleine*.—The chemical composition of this ptomaine has not been determined. It dilates the pupils and elevates the temperature from 1° to 2° when injected under the skin.

" Among the oxygen containing ptomaines, the most important are:

1. " *Neurine*—C_5 H_{13} NO, contracts the pupil, lessens the respirations, hastens the action of the heart, causes profuse diarrhoea and the involuntary emission of urine.

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* See the Report of Doctor Vaughan to the Michigan State Board of Health for 1885.

According to Gautier putrid cheese yields *neuridine*.

2. "*Choline*—C_5 H_{15} NO_2, is found in small quantity in the bile as well as in putrid matter. It is less powerful in action than neurine, which it resembles.

3. "*Gadinine*—C_7 H_{16} NO_2, discovered by Brieger, is not poisonous."

Doctor A. M. Brown * arranges the ptomaines into "two classes, the non-oxygenous and oxygenous. The first come from the pyridic bases of Gautier, or those ptomaines which, besides being the most abundant, persist throughout the whole of the putrefactive process."

"NON-OXYGENOUS ALKALOIDS.

1. "*Parvoline*, C_9 H_{13} N.—This was the first ptomaine chemically analysed and defined. It was discovered by Gautier and Etard in the putrefactive products of the mackerel and horse flesh...... It is described by them as an oily base......

2. "*Hydro-Collidine*, C_8 H_{13} N.—This base has also been obtained from the putrefactive products of the mackerel and horse, and even ox

* A treatise on the animal alkaloids, cadaveric and vital; or the ptomaines and leucomaines, etc. London, 1887, p. 31 et seq.

flesh...... it is very poisonous, even in very small quantities.

3. "*Base*, C_{17} H_{36} N_4.—......The analysis which Gautier and Etard have made of this chloroplatinate enables them to establish the formula C_{17} H_{13} N_4 2 H Cl.

4. "*Base*, C_{10} H_{15} N.—This ptomaine was discovered in 1883, by Guareschi and Mosso, who isolated it by the Gautier-Etard method from the putrid fibrine of the bullock...... It has also been detected among the basic products arising from the putrefaction of cephalopod pulps......

5. "*Collidine*, C_8 H_{11} N.—Was extracted by Nencki, in 1876, from the putrefactive products of...... gelatine and...... of bullock pancreas, (*mixed with water*)......

6. "*Neuridine*, C_5 H_{14} N_2.—This base is one of the most constant products of the putrefaction of albumenoid substance. The ptomaine was discovered in 1884 by Brieger, who has since detected it in the putrescent matters of flesh, fish, decaying cheese, etc...... Chemically pure neuridine is not toxic.

7. "*Cadaverine*, C_5 H_{16} N_2.—In bodies subjected to prolonged putrefaction, Brieger has met with a base of very difficult purification, to which he has given the name of cadaverine. Boeckersh

has separated it from herring brine, and quite re-eently—1884—the alkaloid has been detected in marine cephalopod pulp. The ptomaine is not toxic.

8. "*Putrescine*, $C_4 H_{12} N_2$.—Like the preceding ptomaines, it is obtained from the flesh of the mammifera, and from herring brines. It is not toxic.

9. "*Mydaleine*.—In the mother liquors from which the preceding bases have been isolated owing to the varying solubility of their platini-chlorides, there remains a toxic alkaloid which has also been isolated, but in too small quantities to permit of its complete study. The analysis of it is suggestive of a diamine similar to those we have been dealing with......

"OXYGENOUS ALKALOIDS.

"These bases serve as the connecting link between the ptomaines and the leucomaines. With the exception of gadinine they are to be met with in the normal tissues as well as in putrescent animal materials.

1. "*Neurine*, $C_5 H_{12} N (O H) = \begin{array}{l} (C H_3) \searrow \\ \qquad\qquad\quad N O H. \\ C_2 H_3 \nearrow \end{array}$

"Hydrate of trimethylvinylammonium.

"It is known that the breaking up of a complex compound with a watery solution of baryta, the lecithine present in the animal economy, by taking up or fixing the water, furnishes besides phosphoglyceric and stearic acids, and a base choline $C_5 H_{13} NO_2$ the synthesis of which Wurtz effected in treating trimethylamine with oxyde of ethylene in the presence of water

$$\left.\begin{array}{l} C\,H_2 \\ C\,H_2 \end{array}\right\rangle O + (C\,H_3)_3\,N + H_2\,O = \left.\begin{array}{l} (C\,H_3)_3 \\ C_2\,H_4\,O\,H \end{array}\right\rangle N.\,O\,H$$

"This synthesis characterises choline as the hydrate of trimethylhydroxethylene—ammonium. Treated with hydriodic acid, choline is converted into an iodide of iodethylene-trimythyl-ammonium

$$\left.\begin{array}{l} (C\,H_3)_3 \\ C_2\,H_4\,O\,H \end{array}\right\rangle N.\,O\,H + 2\,H\,I = 2\,H_2\,O + \left.\begin{array}{l} (C\,H_3)_3 \\ C_2\,H_4\,I \end{array}\right\rangle N\,I.$$

"The oxyde of silver transforms this latter body into a new base neurine which is a hydrate of trimethylvinylammonium

$$\left.\begin{array}{l} (C\,H_3)_3 \\ C_2\,H_4\,I \end{array}\right\rangle N.\,I + Ag_2\,O = 2\,Ag\,I + \left.\begin{array}{l} (C\,H_3)_3 \\ C_2\,H_3 \end{array}\right\rangle N.\,O\,H.$$

"This is the neurine that has been met with by Brieger in the products of cadaveric putrefaction, when it arises from the breaking up of lecithine. It is a syrupy base soluble in water in any proportion, strongly alkaline; its chloroplatinate well crystallised may be removed from the mother liquors of the neuridine. This base is toxically interesting.

2. "*Choline*, $C_6 H_{15} N O_2 = \begin{matrix} (C\ H_3)_3 \searrow \\ C_2 H_4 - O H \nearrow \end{matrix} N. O H.$

Hydrate of trimethylhydroxethylenine—ammonium.

"It is Stricker who has isolated this body from the bile. It is distinguished from neurine by the composition and formula of constitution as given above. The choline is a base which is elaborated both during normal life of the tissues, and during their bacterial destruction, and is therefore, both ptomaine and leucomaine. Brieger has isolated it by crystallising in the form of picrate of choline in the mother liquors from which he derives the neurine......

Choline is less toxic than neurine.

3. "*Muscarine*, $C_6 H_{13} N O_2$, was discovered by Schmiedeberg and Koppe in the toadstool—*agaricus muscarius.* Schmiedeberg and Hartnack have accomplished its synthesis by oxydising

choline with nitric acid; this permits muscarine to be regarded as an aldehydic alkaloid.

$$\left.\begin{matrix} (CH_3)_3 \\ C_2H_3O \end{matrix}\right\rangle NOH.$$

"Brieger has isolated it along with ethylene-diamine in putrid fish meat. Muscarine is found present in the mother liquors, in which the chloride of platinum has precipitated the ethylene-diamine......

Muscarine is a violent poison.

4. "*Gadinine*, $C_7H_{16}NO_2$.—Brieger obtains this body at the same time and along with the preceding base from the cod-fish—*gadus callarius*—in process of putrefaction. This alkaloid has not been isolated in a free state...... Its salts are not toxic.

5 and 6. *Bases*, $C_2H_{18}N_2O_6$, and $C_6H_{12}N_2O_4$.—Pouchet has published since 1880, quite a series of interesting works on the ptomaines. He endeavours to isolate by a somewhat similar method to that of Stas and Drugendorff, the alkaloids of the residuary liquors resulting from its industrial treatment of bones, flesh, and débris of every kind, by dilute sulphuric acid......

"In the course of his researches, Brieger has detected other alkaloids still less defined or simply indicated, which are having now his careful study......"

BRIEGER'S NOMENCLATURE.

The following table is arranged after Brieger's nomenclature; the several ptomaines occupy the relative positions in which they appear in the French translation of his work.*

I. Ptomaine of peptone.

1. *Peptoxine.*

II. Ptomaines of putrefied meat.

1. *Neuridine*
2. *Neurine*
3. *Choline.*

III. Ptomaines of putrefied fish.

1. *Ethylene-diamine*
2. *Animal muscarine*
3. *Gadinine*
4. *Triethylamine.*

IV. Ptomaines of putrefied cheese.

1. *Neuridine*
2. *Trimethylamine.*

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* L. Brieger, Microbes, ptomaines et maladies. Ouvrage tradnit de l'Allemand par les Docteurs Roussy et Winter. Paris, 1887.

V. Ptomaines of putrefied gelatine.

1. *Isophenyl-ethylamine of Nencki.*
2. *Neuridine of gelatine*
3. *Dimethylamine.*

VI. Ptomaine of putrid yeast.

1. *Dimethylamine of yeast.*

VII. Ptomaines of the human cadaver.

1. *Choline*
2. *Neuridine*
3. *Cadaverine*
4. *Putrescine*
5. *Saprine*
6. *Trimethylamine*
7. *Mydaleine.*

When putrefaction occurs at a low temperature the toxic alkaloids are developed slowly, and *vice-versã.*

In the different states of putrefaction of human cadavers, Brieger has found ptomaines which disappear to be replaced by others. *Lecithine,* which exists normally, is followed by *choline,* then other alkaloids are elaborated. On the second day *neuridine,* which is accompanied by choline, is found. The choline soon begins to disappear in favor of *trimethylamine.* The neuridine then increases; the greater quantity being furnished by the intestines, the large parenchymatous organs containing but little of this salt. On the seventh day of putrefaction the choline disappears while the neuridine lasts until the fourteenth day. For two days after the beginning of putrefaction there is no poison as the first two alkaloids are not toxic. *Cadaverine* increases during the whole process of putrefaction. With cadaverine, *putrescine* and *saprine* are ordinarily found. Choline and trimethylamine are not toxic except in large quantity. The really strong poisons are not developed until fifteen days from the beginning of putrefaction. Mydaleine is not developed until three weeks. It is the most toxic of all the alkaloids. Injected in small quantity into guinea-pigs and rabbits, it causes inflammation of the mucous membranes, dilatation of the pupils, and increase of the body temperature. An injection containing half a centigramme of mydaleine caused the sudden death of a cat. It gives rise to profuse diarrhoea and vomiting. (Gautier).

Nicati and Rietsch have obtained, from pure cultures of the cholera bacillus, a ptomaine which, they say, produces symptoms of cholera when injected into the body of an animal.

Gautier says that the typhoid fever bacillus of Eberth does not cause putrefaction, but that the liquids in which it has lived contain a trace of a base which possesses the property of dilating the pupils, and causes diarrhoea, and very soon death.

From cultures of the tetanus bacillus, growing in connection with a non-pathogenic organism from which it has not yet been freed in pure cultures, Brieger has separated a ptomaine which he calls tetanin, and which, injected hypodermically, produces, in animals, symptoms similar to those induced by inoculation with the organisms themselves, namely symptoms of tetanus.* (Communicated by Doctor Prudden).

Brieger has "obtained from mussels, (1,) a non-poisonous substance; (2,) a substance which is isolated by means of platinum chloride, and which produces energetic salivation and diarrhoea; (3,) the specific virus, which combines only with the tetrahedral platinum chloride. It possesses the characteristic properties of curare; (4,) an analogous body, probably a decomposition-product. It is an energetic poison and occasions shiverings. Non-poisonous mussels, if brought in from the offing and deposited in the harbor, become poisonous, but lose this property again if returned to the open sea. (Is the development of the poisonous principles occasioned

* Deutsche Med. Wohenschr. Apl. 14th, 1887, p. 303.

by the mussels feeding npon sewage-matters?" *)

Carles has discovered in decayed salt cod-fish a red micrococcus, and describes the condition under the name of red stock-fish.

Gautier asserts that putrid fish yields a poison which has the same composition and action as muscarine.

Gautier desiring to ascertain if the saliva of the higher orders of animals contains a poison similar to the venom of serpents, found, in the saliva of man a toxic alkaloid which narcotises birds. This alkaloid, he says, resembles cadaveric alkaloids, is soluble in water, is not an albumenoid and is indestructible by a heat of 212°.

The study of ptomaines is of very great importance alike in chemistry, pathology and legal medicine. Particularly in the last named department of medicine, when it is considered that most of the ptomaines are liable to be mistaken for such vegetable alkaloids as strychnia, veratria, nicotia, hyoscyamia, atropia, etc.

The body of a man who has died from the effects of a poison does not contain ptomaines until decomposition has been fairly established, but the ptomaines are found under the same condition of

* *Chemical News*, June 1886.

putrefaction when the cause of death is other than poison.

Doctors Brouardel and Boutmy report that having analyzed the viscera "of a person asphyxiated by charcoal fumes, they found them free from poison. Eight days later the same viscera were again subjected to analysis and found to contain a solid organic base presenting the general characteristics of alkaloids, and toxic enough to kill, even in small doses, frogs and guinea pigs. This shows that putrefaction gives rise to organic alkaloids when no poisoning has taken place."

On another occasion they "found a venenous ptomaine in a subject poisoned by arsenious acid, thereby agreeing with Professor Selmi who, in 1873, met with the same ptomaine in two subjects also poisoned by arsenic. Hence it is seen that ptomaines will form as well in subjects who come to their death without poison, as in those who died from the ingestion of a poison, like arsenic, possessing strong antiseptic properties."

Some of the ptomaines are very poisonous to man when ingested with food. An illustrative case of ptomaine poisoning is related as follows: "Twelve persons who had eaten a tainted goose containing an alkaloid resembling conia, offered all the symptoms of dangerous poisoning. One of them even died in a few hours, after copious vomitings, although no other cause of death but the presence of ptomaine could be detected. Hence it may be concluded that ptomaines can cause the death of man as well as of animals—as they are known to do. Much time is not necessary for the formation of these alkaloids, for the goose above mentioned had been bought at the market on the very morning of the poisoning accident, and had passed the regulation inspection."

This should be a warning to those who have acquired a taste for what is called "high game," which is game in a more or less advanced state of decay and in which ptomaines have already been formed.

The reported cases of poisoning ascribed to eating partridges that were supposed to have fed on the cocculus indicus or fish-berry, were, in all probality, ptomaine poisoning.

Doctor Lauder Brunton, of London, cautions the people against the indiscriminate use of the digestive ferments and of artificially digested foods as likely to contain poisonous alkaloids. This caution may be extended to the case of canned foods.

The existence of ptomaines has been denied, but the weight of evidence is overwhelmingly in favor of their formation in putrid animal matter. Some of them are said to be very noxious, while others possess scarcely any toxic properties. They are not developed until putrefaction is established, therefore refrigeration of the body has been recommended as the simplest means of retarding decomposition in case a medico-legal investigation should be necessary to establish the presence or absence of poison in the body.

A case in point, is related, of a sudden death, where there were suspicions of poisoning. Doctor Brouardel, who had charge of the inquiry, caused the body to be immediately conveyed to the Paris Morgue for refrigeration. An examination was duly made and no poison was found in the body. Had decomposition begun, a doubt would have arisen, and its solution would have been very difficult if not impossible if a ptomaine had been found and could not be easily distinguished from a poisonous vegetable alkaloid.

Leucomaines.—There have been many differences of opinion respecting the origin of leucomaines. According to Bouchard, alkaloids are found in animal matter where microscopic mushrooms live and swarm; and he regards them as products of the disintegration of vegetable organisms. He thinks that, if these bacteria, living in animal matter, manufacture alkaloids, it may be asked if other bacteria, swarming in a living organism may not produce analogous substances. To verify this supposition he examined the urine of patients affected with infectious diseases and constantly found therein some of these alkaloids. However, distinct traces of such alkaloids are found in the urine of healthy persons, but this does not prove that they are not developed from forms of vegetable organisms. It was long ago shown that, in health, there are great quantities of microbia in the alimentary canal; this being the case, alkaloids may be formed in the intestines, absorbed, and finally eliminated with the urine.

Bouchard has shown that all recent fecal matter contains alkaloids in amount proportionate to the quantity to microbia, and formulates the following propositions:

1. Alkaloids exist in the healthy human body;

2. They are manufactured in the digestive tube, and are apparently elaborated from vegetable organisms, agents of intestinal putrefaction;

3. The alkaloids of normal urine represent a part of the alkaloids of the intestines, absorbed into the system and eliminated by the kidneys;

4. Diseases which tend to increase intestinal putrefactions, augment, by this process, the amount of the urinary alkaloids.

5. While regarding as probable that these alkaloids, in certain infectious discases, have for origin the microbia infesting the solids and fluids, it may be positively asserted that, in typhoid fever especially, a part, at least, of the urinary alkaloids are intestinal products.

According to Gautier, leucomaines are only in part the products of bacterian ferments. He has shown that they do not all spring from this source for, he and others have found that the body contains the following named crystallizable alkaloids; *Karnine*, *Adenine*, *Guanine*, *Sarkine*, *Xanthocreatinine*, *Crusocreatinine*, *Amphicreatinine*, *Xanthine*, and *Pseudoxanthine*, besides the "extractives" which are very toxic. He accounts for their development as follows: he has demonstrated that the higher animals are anaërobic * in a considerable proportion, and it is now acknowledged that nearly two tenths of man's disassimilations are produced at the expense of the tissues themselves without any aid of oxygen; the tissues living, in part, after the manner

* The terms aërobia and anaërobia, were proposed by Pasteur to designate two classes of low organisms. The former incapable of living without free oxygen, and the latter multiplying itself indefinitely without the aid or presence of oxygen.

of anaërobic or putrid ferments; the animal cells are then comparable, by their action on organic matter, to bacteria, and in their products of dis-assimilation should be found the same substances as in the products of putrid fermentation of the albumenoids. These alkaloids have been found not only in the urine, but in the blood, in the saliva, etc.

In a physiological state, these poisons are eliminated by the kidneys, skin, and alimentary canal, when they have not been consumed by the oxygen of the blood, for they are ordinarily very oxydizable.

When the aëration of the blood is imperfect, leucomaines or substances of their nature accumulate in the blood and give rise to morbid processes. Along with these substances there are others (the "extractives"), equally nitrogenous but not alkaloidic, which always accompany them and are endowed with still greater toxic properties. If the elements of the tissues can act as do microbia and engender, like them, toxic products, it should be admitted that certain infections are not heterochtonous. The action of these poisons differs from that of animated beings by the following characters:

1. They act only when they are found in appreciable quantity in the organism.

2. Their consequences have an intensity proportionate to quantity.

3. These consequences are almost immediate, there being no incubation.

Gautier thinks that an appreciable distinction may be made between bacterial and autochtonous alkaloids. But other observers entertain the belief that it is not possible in the present state of knowledge of the subject to indicate the precise point where the former series ends and the latter begins, for, some of them are common to both types.

Doctor A. M. Brown has arranged the leucomaines as follows :

"I. THE URIC LEUCOMAINE GROUP.—
BETAINES.

Betaine is the representative of this group, having the chemical formula of

$$C_5 H_{11} N O_2 = \begin{array}{l} (C H_3)_3 = N - O \\ \qquad\qquad\;\, | \\ \qquad\qquad C H_2 - C O. \end{array}$$

"The base was originally discovered in beetroot in 1866 by Scheifler, and in 1869 Liebreich detected its presence in human urine.

1. *Karnine*, $C_7 H_8 N_4 O_3$.—Commences the natural series of alkaloids of the urine groups. The base was isolated from imported meat by

Weidel, and afterwards in yeast waters by Schutzenberger.

2. *Adenine*, $C_5 H_5 N_5$.—Discovered by Kossel in 1885.

3. *Guanine*, $C_5 H_5 N_5 O$.—Discovered in 1884 by Unger, and since met with in a great number of products of animal nature; in the flesh, the organs and the excremental matters of certain mammifera, in fowls, and fish, and also in certain plants.

4. *Sarkine* or *hypoxanthine*, $C_5 H_4 N_4 O$.—Found in certain plants, but for the most part in animal tissues.

5. *Xanthine*, $C_5 H_4 N_4 O_2$.—Is widely distributed in the organism, in almost all the liquids and tissues of the animal economy from the splitting up of neucleine. The base was first isolated by Marcet in 1819.

6. *Pseudo-xanthine*, $C_4 H_5 N_5 O$.—Discovered by Gautier in the muscular tissue of the higher animals.

"These last four leucomaines form a distinct group, as to community of origin, with analogous chemical properties:—(1,) They all possess a combination ($C_5 H_4 N_4$) of a remarkable stability, analogous in certain respects to the stability of pyridic compounds. (2,) They can all give up cyanhydric acid, and two of them, xanthine and hypoxanthine, may be obtained synthetically in operating with the same cyanhydric acid. (3,) All of them are derived from albumenoid substances by reactions which are identical in origin. (4,) Three of them present in a high degree that insolubility in water which the pyridic compounds exhibit.

" Hydrocyanic acid forms the chemical skeleton of that cellular nucleus which is the most active phenomenon of vitality.

"II. THE KREATININE LEUCOMAINE GROUP.

1. That well known base, *Kreatinine*,

$$C_4 H_7 N_3 O\ NH = C \begin{matrix} NH - CO \\ \qquad\quad | \\ N(CH_3) - CH_2 \end{matrix}$$

heads the list of the other new alkaloids discovered by Gautier since 1881. They are all of fresh-meat origin. Kreatinine was discovered by Liebig in the action of chlorohydric acid on Kreatine, and Pettenkofer afterwards found it in human urine.

2. *Xantho-creatinine*, $C_5 H_{10} N_4 O$.—The most abundant of these bases, is of cadaveric odour, soluble in cold water, and with a strongly alkaline reaction.

3. *Crusocreatinine*, $C_5 H_8 N_4 O$.—Possessing the

general properties of Kreatinine which it strongly resembles in chemical elements and alkalinity.

4. *Amphicreatinine*, $C_9 H_{19} N_7 O_4$.—Corresponds with two molecules of Kreatine plus the C N H groupment, thus having the closest analogy to Kreatine, although the formula seems to differ widely from it.

"III. AN UNCLASSIFIED GROUP—ACCORDING TO THEIR SOURCES.

1. *From the urine.*—A uride—allantoine—and a base—Karnine—already known, a second alkaloid has been discovered with the formula $C_7 H_{14} N_4 O_2$.

2. *From the blood and important viscera.*—Alkaloids have been met with in appreciable quantities.

3. *From the spleen.*—Mr. Morel, of Lille, has obtained an alkaloid isolated in deliquescent crystals.

4. *From the intestines.*—A base which seems to belong to the pyridic group isolated from choleraic dejections.

5. *From the saliva.*—Gautier has determined the existence of an alkaloid in human saliva.

6. *From the venoms of certain snakes and batrachians* as well as certain *mollusca* and *fishes.*—

From this latter class, Brieger has identified an active principle in the *mytiloxin* and has given its formula as $C_6 H_{15} N O_2$."

The "Extractives."—It has been ascertained, that the ptomaines and leucomaines are accompanied by equally nitrogenous but not alkaloidic substances the exact nature of which is not yet known. But the fact has been verified that they are endowed with greater toxic properties than the ptomaines and leucomaines. They are called the extractives for convenience of distinction. Not being well known, they cannot yet be properly named.

"According to the different sources of poisoning; ...... there are different indications, signs, or symptoms, capable of classification as below: (1,) Poisoning by the 'extractives' is attended by hyperthermia. (2,) Poisoning by the 'animal alkaloids' is accompanied by hypothermia. (3,) A combination or succession of hyperthermic and hypothermic phenomena may become manifest, according to the combination or alternation of poisoning by the deleterious physiological products, or their antagonistic action." (Brown, quoted from Aitken).

The body of man in health may become poisoned by the gradual accumulation, within itself, of deleterious substances normally elaborated but imperfectly eliminated. Hence the slow and insidious onset of much ill health, from which recovery is correspondingly slow. Constitutional diseases such as gout and rheumatism being examples of the effects of this auto-infection. (Aitken). How this auto-infection takes place Doctor Brown says, can only be understood and explained by the mode in which the phenomena of life are regarded. "Life is the result of the combination of many physiological processes, in the concurrent exercise of the bodily functions which are essentially relative and contingent on each other, implying at the same time a series of partial and local deaths. Thus it is that the organism lives on conditions of incessant elementary disintegrations."

Man resists the auto-infection to which he is constantly exposed; "(1,) by the elimination through the liver, the kidneys, the skin, the lungs, and the intestinal mucous membrane; (2,) by the destruction of the toxic products by oxygenation, which consists in a continuous combustion of the leucomaines by the oxygen of the blood, in which they are consumed, or partially in the tissues and organs."

The foregoing summary of the present state of knowledge of the ptomaines, leucomaines and "extractives," is abstracted from the works of

Hallopeau, * Cornil and Babes, † Gautier, ‡ Brieger, ‖ Brunton, ‖‖ Brown, § Aitken, §§ and from the *Chemical News.* ¶

The fact that the genesis of infectious diseases is bacteric or at least ptomainic, is accepted by many experienced pathoanatomists and practising physicians, and also by surgeons, particularly in the case of septicaemia occurring after severe injuries or after surgical operations.

The study of the clinical aspects of the ptomaines, leucomaines, and "extractives," so well begun by Doctor Lauder Brunton and Sir William Aitken of London, by Professor Peter of Paris, and by other clinicians, will surely lead

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* Traité Elémentaire de Pathologie Générale. Paris 1887.

† Les Bactéries, etc. Paris 1886.

‡ Sur les alcaloides dérivés de la destruction bactérienne ou physiologique des tissues animaux. *Bulletin* de *l'Académie de Médecine.* Paris 1886.

‖ Microbes Ptomaines et Maladies. Ouvrage traduit de l'Allemand par le Dr. Roussy et J. Winter. Paris 1887.

‖‖ On disorders of digestion, their consequences and treatment. London 1886.

§ A Treatise on the Animal Alkaloids, Cadaveric and Vital; or the Ptomaines and Leucomaines. London 1887.

§§ On the Animal Alkaloids, etc. American edition. Philadelphia 1887.

¶ The "Chemical News," 1886–7.

many physicians earnestly to consider this very important subject.

For convenience and a clearer understanding of the subject it would be well for a number, if not all, of the bio-chemists, who are engaged in the investigation of the ptomaines, leucomaines and "extractives," to have a conference for the purpose of constructing a uniform nomenclature and classification of these toxic agents.

34. Pyosapraemia * signifies putrid-pus infection of the blood. The term pyaemia is ordinarily employed to designate the condition above named, because it was originally believed that pus cells effected an entrance into the circulation. It is now known that the pus of a wound does not pass into the blood current, but that the elements of putrid-pus make their way into the blood. Therefore the term pyosapraemia is the more exact.

Pyosapraemia differs from septicaemia both clinically and pathically. Septicaemia often occurs before the formation of pus, and the blood is poisoned in the manner already stated, while pyosapraemia may not show itself until several weeks after the infliction of a wound. In septicaemia there are generally no secondary ab-

* From πυος, pus, σαπρος, putrid, and αἷμα, blood.

scesses. In pyosapraemia infective thrombi, swarming with microörganisms, are formed in the veins and carried into circulation to cause multiple abscesses in the viscera and other parts of the body distant from the spot injured. In these thrombi, the *staphylococcus* and *streptococcus pyogenes* are found.

A word concerning bacteria in general may not here be out of place, for their importance in medicine and surgery is undoubted by those who have critically examined the whole subject. The great question, not yet solved, is to what extent the bacteria themselves constitute the morbific cause, and to what extent this cause is to be sought in the infection of the blood by the alkaloids which these microörganisms manufacture.

Bacteria.—Towards the end of the seventeenth century, Leuwenhoek discovered the leptothrix and vibrio in the saliva and faeces, and believed these microörganisms to be animalcules. It was not until 1838 that they were looked upon as bacteria. In his thesis for the doctorate in science (1853) Ch. Robin classed vibriones and bacteria with algae and yeast fungi. It is, however, only in the last fifteen or twenty years that bacteria have been largely studied in their relation to disease. These studies were not instituted until some time after Davaine and Pasteur had demonstrated the connection of bacteria with certain diseases of the lower animals, notably anthrax.

The microbia are so largely diffused in the air, water and earth, and the destructive properties of these infinitely small organisms are so great that they have been styled the masters of the world. The schizomycetes, which contribute most of the pathogenic species, as their name implies, are multiplied by division and with great rapidity. They are parasitic, living upon organized substances which they destroy by causing fermentation and putrefaction. They float in the air mixed with dust, are found in stagnant water, in sewers, in sluggish streams flowing through cities, in harbors, on the sea coast, and even in the depths of the ocean ; in fact wherever they find sustenance. They occur in large quantities in the mouth and in the fecal matter of man and beast. In the soil their quantity is prodigious, particularly in damp places, or during rainy season. Duclaux has shown that the germination of plants cannot take place in a soil which has been deprived of microörganisms, and that plants cannot utilise organic substances until these have been modified by the microbia.

The bacteria infest the human body by effecting entrance principally through the respiratory and digestive organs. Cheese and fermented milk are filled with microörganisms. It is said that the gastric juices arrest their growth. Pasteur and Duclaux are of opinion that digestion cannot be effected without their intervention.

The schizomycetes probably appeared among the first vegetables. Van Tieghem has found them in coal. They have always occured in the mouth of man. Zopf and Miller have found rods of leptothrix upon the teeth of Egyptian mummies. (Cornil and Babes.)

Since 1870 Cohn and other bacteriologists have devoted much time and labor to the study and arrangement of pathogenic microörganisms, and Budd, Pollender, Naegeli, Zopf, Van Tieghem, Koch, Rabenhorst, Flügge, Sternberg, and many others have contributed valuable material in illustration of the assertion that "infectious diseases are due to a living contagion." * This statement, respecting infectious diseases, made, as a hypothesis, many years ago, by Henle, Sir Henry Holland, and J. K. Mitchell, of Philadel-

* As long ago as the middle of the eighteenth century, Needham, Buffon, Spellanzani, Bonnet, and others, had demonstrated the existence of low organisms in putrid matter, but without clearly understanding their nature, although they considered these organisms as factors in the production of disease.

phia, is now, by most pathoanatomists, considered as demonstrated.

Davaine seems to have been the first to establish that these microörganisms are vegetable and not, as originally believed, animal parasites. Cohn placed them in the class of Schizospores (cleaving spores) and found that they contained no chlorophyll. Naegli named them Schizomycetes (cleaving fungi), and Billroth asserted that they consisted of only one species, which he called coccobacteria septica.

Cohn has divided morphically the schizomycetes into four groups:

1. Sphero-bacteria, or globular bacteria, *cocci*;
2. Microbacteria, or bacteria in rods, *short rods*;
3. Desmobacteria, or bacilli, *long rods*;
4. Spiro-bacteria, or spiral bacteria, *spirilla*.

SYNOPSIS

OF COHN'S CLASSIFICATION OF BACTERIA.

Schizophytes.—Thallophytes being developed by division or by endogenous germinative cells.

First tribe.—A. Free cells united by two or by four.

Spherical cells.....*chroococcus* (Naegli).
Cylindrical cells....*synechococcus* (Naegli).

B. Cells united in zoogloeae by an amorphous substance.

a. Cellular membrane confounded with the intercellular substance.

Sphericial cells....*micrococcus* (Hallier).

Cylindrical cells...*bacterium* (Dujardin).

b. Intercellular substance arranged in concentric layers.

Round cells.............*glaeocapsa.*

Cylindrical cells.........*glaeothece.*

C. a. Cells forming circumscribed zoogloeae of definite form, families arranged in plates of a single layer....*merismopedia.*

Round cells arranged in a network of zoogloeae....*clathrocystis.*

Cylindrical and cuneiform cells, families divided by constriction...*coelosphaerium.*

Cells forming families with several layers united in cubical, colorless corpuscles, with quarternary arrangement...*sarcina.*

Very great but undetermined number of colorless cells....*ascococcus.*

Second tribe, nematogenes.—Filamentous cells.

A. Without ramifications:

1. Cylindrical, colorless, with little marked division, very slender, short, *bacillus*;—long, *leptothrix.*

2. Cylindrical filaments, thicker and longer, *beggiatoa.*

3. Broken, with colorless conidia, *crenothrix.*

4. Spiral, short, and undulated filaments, *vibriones*;—short, with rigid spirals, *spirillum*;—long, with flexible spirals, containing phycochrome, *spirocyth*;—long filaments and flexible spirals, *spirulina.*

5. Filaments in beads without phycochrome, *streptococcus.*

6. Cylindrical and colorless zoogloeae, *myconostoc*;—in beads, *nostoc*;—filaments thinned at one extremity, *rivolaria.*

B. Filaments with false ramifications, *cladothrix*;—cylindrical and colorless filaments, *streptothrix.*

SYNOPSIS OF ZOPF'S PLEOMORPHIC CLASSIFICATION OF THE SCHIZOMYCETES.*

Zopf divides the schizomycetes (fission-fungi) into four groups: Coccaceae; Bacteriaceae; Leptotricheae; Cladotricheae; sixteen genera: Streptococcus; Merismopedia; Sarcina; Micro-

* Taken in greater part from *Crookshank's Manual of Bacteriology.* Second edition, 1887.

coccus; Ascococcus;—Bacterium; Spirillum; Leuconstoc; Bacillus; Vibrio; Clostridium;—Crenothrix; Beggiatoa; Phragmidiothrix; Leptothrix, Cladothrix;—and one hundred and ninety-five species.

Group I. Coccaceae.

Possessing, so far as known, only cocci, and thread forms resulting from the juxtaposition of cocci. The fission occurring in one or several directions.

Genera: 1, *Streptococcus*; 2, *Micrococcus*; 3, *Merismopedia*; 4, *Sarcina*; 5, *Ascococcus*.

Genus I. *Streptococcus* (chain cocci).

Divide in only one direction. The cocci are generally united in the form of chains.

Species.

Species associated with disease in man and animals.

1. Streptococcus pyogenes.. Pathogenic in man and animals.
2. " " malignus.. Saprophytic in man, pathogenic in animals.

3. Streptococcus pygenes aureus....Pathogenic in man and animals.
4. " " albus......Pathogenic in man and animals.
5. " " citreus ....Pathogenic in man and animals.
6. " cereus albus..Associated with pus, but not pathogenic in man or animals.
7. " cereus flavus..Associated with pus, but not pathogenic in man or animals.
8. " erysipelatosus..Pathogenic in man and animals.
9. " toxicatus......Pathogenic (?)
10. " in puerperal fever..Possibly saprophytic only.
11. " in endocarditis.....Possibly saprophytic only.
12. " in diphtheria.......Possibly saprophytic only.
13. " articulorum..Saprophytic in man, pathogenic in animals.

14. Streptococcus in cerebro-spinal meningitis... Possibly saprophytic only.
15. " in yellow-fever.. Possibly saprophytic only.
16. " in dental caries.. Possibly saprophytic only.
17. " variolae et vacciniae.. Pathogenic in man (?) and animals (?).

Species associated with disease in animals.

18. Streptococcus of swine-erysipelas... Pathogenic (?).
19. " of cattle plague......... Pathogenic.
20. " of foot and mouth disease "
21. " of septicaemia consecutive to anthrax .... "
22. " septicus................. "
23. " of progressive tissue necrosis in mice........ "
24. " perniciosus.......... Pathogenic (?).
25. " bombycis .... Pathogenic.
26. " insectorum..... Possibly saprophytic only.

Species unassociated with disease.

27. Streptococcus viscosus.... Zymogenic saprophyte.

28. Streptococcus coronatus . . Simple saprophyte.
29. " radiatus . . . . " "
30. " flavus desidens . . " "

Genus II. *Merismopedia*, (Plate-cocci).

Divide in two directions, forming lamellae or plates.

Species.

Species associated with disease.

1. Merismopedia gonorrhoeae. Pathogenic in man.
2. Micrococcus tetragonus . . Saprophytic in man, pathogenic in animals.
3. Diplococcus albicans tardissimus . . Saprophytic in man.

Species unassociated with disease.

4. Micrococcus citreus conglomeratus . . Simple saprophyte.
5. " subflavus . . . . Simple saprophyte.
6. " albicans amplus . . . " "

Genus III. *Sarcina*, (Packet-cocci).

Divide in three directions, forming colonies in cubes or packets.

Species.

Unassociated with disease.

1. Sarcina lutea . . . . . . Chromogenic saprophytes.

2. Sarcina aurantiaca.		Chromogenic	saprophytes.
3. "	ventriculi........	Simple	saprophytes.
4. "	intestinalis.......	"	"
5. "	urinae...........	"	"
6. "	litoralis	"	"
7. "	Ritenbachii......	"	"
8. "	hyalina...........	"	"
9. "	alba..............	"	"

Genus IV. *Micrococcus*, (Mass-cocci).

Divide in one direction, after division the cocci may remain aggregated in irregular heaps, but never form chains.

Species.

Species associated with disease in man.

1. Micrococcus in scarlatina......	Possibly	only	saprophytic.
2. " in measles....	Possibly	only	saprophytic.
3. " in whooping cough	"	"	"
4. " in haemophilia neonatorum	"	"	"
5. " in typhus......	"	"	"
6. " in acute yellow atrophy	"	"	"
7. " in dental caries	"	"	"
8. " in gangrene...	"	"	"

9. Micrococcus pyogenes tenuis. . Possibly only saprophytic.
10. " in rabies . . . . Pathogenic (?).

In animals.

11. " of septicaemia in rabbits. . . . . Pathogenic.
12. " of pyaemia " " . . . . "
13. " of progressive suppuration in rabbits. . . . . "
14. " parvus ovatus . . . . "
15. " of pyaemia in mice . . . . "

In plants.

16. Micrococcus amylivorus . . . . . . Pathogenic (?).

Species unassociated with disease.

17. Micrococcus cyaneus. . . . Chromogenic saprophyte.
18. " aurantiacus. Chromogenic saprophyte.
19. " chlorinus. . . " "
20. " violaceus. . . " "
21. " luteus . . . . . " "
22. " rosaceus . . . " "
23. " haematodes " "
24. " candidus. . . . . Simple saprophyte.
25. " candicans. . . . . " "
26. " foetidus. . . . . " "
27. " crepusculum . . . . . " "
28. " cinnabareus . . . . . . " "

29.	Micrococcus flavus liquefaciens....	Simple saprophyte.	
30.	" " tardigradus	"	"
31.	" versicolor	"	"
32.	" viticulosus.......	"	"
33.	" lacteus faviformis.	"	"
34.	" fulvus	"	"

Genus V. *Ascococcus*, (Pellicle-cocci).

Are like the micrococci, but the cocci grow in characteristic gelatinous pellicles.

Species.

Unassociated with disease.

1. Ascococcus Billrothii. Zymogenic saprophyte.

Group II. Bacteriaceae.

Possessing mostly cocci, rods (straight or bent), and thread forms (straight or spiral). The first may be absent, and the last possess no distinction between base and apex. Division, as far as known, occurs in one direction.

Genera: 1, *Bacterium*; 2, *Spirillum*; 3, *Vibrio*; 4, *Leuconstoc*; 5, *Bacillus*; 6, *Clostridium.*

Genus I. *Bacterium.*

Cocci and rods, or only rods, which are joined to form threads. Spore-formation absent or unknown.

Species.

Species associated with disease in man and animals.

1. Bacterium pneumoniae crouposae....Pathogenic (?); possibly only saprophytic in man, pathogenic in animals.
2. " pseudo—pneumonicum..Saprophytic in man, pathogenic in animals.
3. " Neapolitanum.....Saprophytic in man, pathogenic in animals.
4. " in rhinoscleroma. Pathogenic in man (?).
5. " in diphtheria....Saprophytic in man (?), pathogenic in animals.
6. " saprogenes......Saprophytic in man, pathogenic in animals.
7. " decalvans.......Saprophytic.

Species associated with disease in animals.

8.	Bacterium in diphtheria of calves.....	Pathogenic (?).
9.	" in diphtheria of pigeons....	Pathogenic.
10.	" cholerae gallinarum........	"
11.	" septicum agrigenum........	"
12.	" of septicaemia in rabbits....	"
13.	" of Davaine's septicaemia....	"
14.	" septicum sputigenum.......	"
15.	" crassum sputigenum........	"
16.	" pneumonicum agile........	"
17.	" oxytocum perniciosum	"
18.	" cavicida	"
19.	" coli commune..............	"
20.	" lactis aërogenes............	"
21.	Panhistophyton ovatum.........	"

In plants.

22.	Bacterium hyacinthi..........	Pathogenic (?).

Species unassociated with disease.

23.	Bacterium synxanthum..	Chromogenic saprophyte.	
24.	" indicum......	Chromogenic	saprophyte.
25.	" rubrum......	"	"
26.	" prodigiosum..	"	"
27.	" luteum.......	"	"
28.	" violaceum . . .	"	"

29.	Bacterium brunneum	Chromogenic saprophyte.
30.	" fluorescens putidum	" "
31.	" fluorescens liquefaciens	" "
32.	" ureae	Zymogenic saprophyte.
33.	" aceti	" "
34.	" Pasteurianum	" "
35.	" liodermos	Simple "
36.	" multipediculum	" "
37.	" ramosum liquefaciens.	" "
38.	" Zopfii	" "
39.	" merismopedioides	" "
40.	" Pflügeri	" "
41.	" photometricum	" "
42.	" litoreum	" "
43.	" fusiforme	" "
44.	" navicula	" "
45.	Proteus vulgaris	" "
46.	" mirabilis	" "
47.	" Zenkeri	" "
48.	Bacterium termo	" "
49.	" lineola	" "

Genus II. *Spirillum.*

Threads screw-form, made up of short or long rods only, or of rods and cocci. Spore-formation absent or unknown.

Species.

Species associated with disease in man and animals.

1. Spirillum Obermeieri........... Pathogenic.
2. " cholerae Asiaticae. Pathogenic in man (?), possibly only saprophytic. Pathogenic in animals.
3. " Finkleri.... Saprophytic in man. Pathogenic in animals.
4. " tyrogenum. Saprophytic. Pathogenic in animals.
5. " sputigenum. Saprophytic. Pathogenic in animals.

Species unassociated with disease.

6.	Spirillum plicatile.......	Simple	saprophyte.
7.	" serpens..........	"	"
8.	" tenue............	"	"
9.	" undula..........	"	"
10.	" volutans........	"	"
11.	" Rosenbergii......	"	"
12.	" attenuatum	"	"
13.	" leucomelaneum...	"	"

Genus III. *Leuconstoc.*

Cocci and rods. Spore-formation present in cocci.

Species.

Unassociated with disease.

1. Leuconstoc mesenteroides....Zymogenic saprophyte.

Genus IV. *Bacillus.*

Cocci and rods, or rods only, forming straight or twisted threads. Spore-formation present either in rods or cocci.

Species.

Species associated with disease in man and animals.

1. Bacillus leprae..................Pathogenic.
2. " in syphilis.....Pathogenic (?); possibly only saprophytic.
3. " typhosus.......Pathogenic (?); possibly only saprophytic.
4. " malariae...Pathogenic in man (?), pathogenic in animals.
5. " of choleraic diarrhoea from meat poisoning..Pathogenic.
6. " pyogenes foetidus..Saprophytic in man, pathogenic in animals.

7.	Bacillus in septicaemia in man..		Saprophytic.
8.	" in gangrenous septicaemia.		"
9.	" tuberculosis................		Pathogenic.
10.	" antracis		"
11.	" mallei		"
12.	" of malignant oedema (animals)..........		"
13.	" of septicaemia of mice.....		"
14.	" of ulcerative stomatitis in the calf........		"
15.	" swine-typhoid..............		"
16.	" swine-erysipelas		"
17.	" in tetanus (animals)......		Pathogenic (?).
18.	" alvei (animals).............		Pathogenic.

Species unassociated with disease.

19.	Bacillus ianthinus..	Chromogenic	saprophyte.
20.	" pyocyaneus ..	"	"
21.	" cyanogenus ..	"	"
22.	" acidi lactici.....	Zymogenic	"
23.	" Fitzianus.......	"	"
24.	" subtilis..............	Simple	"
25.	" figurans............	"	"
26.	" of jequirity.........	"	"
27.	" caucasicus	"	"
28.	" dysodes	"	"
29.	" Hansenii...........	"	"
30.	" erythrosporus	"	"

31.	Bacillus septicus	Simple saprophyte.	
32.	" saprogenes	"	"
33.	" foetidus	"	"
34.	" putrificus coli	"	"
35.	" coprogenus foetidus.	"	"
36.	" aerophilus	"	"
37.	" mesentericus fuscus.	"	"
38.	" " vulgatus	"	"

Genus V. *Vibrio.*

Threads screw-form in long or short links. Spore-formation present.

Species.

Unassociated with disease.

1. Vibrio rugula........Zymogenic saprophyte.

Genus VI. *Clostridium.*

Same as bacillus, but the spore-formation is in characteristically enlarged rods.

Species.

Associated with disease in animals.

1. Clostridium of symptomatic anthrax...Pathogenic.

Unassociated with disease.

2. Clostridium butyricum. Zymogenic saprophyte.
3. " polymyxa. " "

Group III. Leptotricheae.

Possessing cocci, rods, and thread forms (which show a distinction between base and apex). The last straight or spiral.

Genera: 1, *Crenothrix*; 2, *Beggiatoa*; 3, *Phragmidiothrix*; 4, *Lepothrix*.

Genus I. *Crenothrix*.

Threads articulated; cells sulphurless; habitat water.

Species.

Unassociated with disease.

1. Crenothrix Kühniana......Simple saprophyte.

Genus II. *Beggiatoa*.

Threads unarticulated; cells with sulphur granules; habitat water.

Species.

Unassociated with disease.

1. Beggiatoa alba ....Simple saprophyte.
2. " mirabilis.......... " "
3. " roseopersicina..Chromogenic "

Genus III. *Phragmidiothrix*.

Threads jointless; successive subdivision of the cells is continuous; cells sulphurless; habitat water.

Species.

Unassociated with disease.

1, Phragmidiothrix multiseptata...Simple saprophyte.

Genus IV. *Leptothrix.*

Threads articulated or unarticulated; successive subdivisions of cells not continuous; cells sulphurless.

Species.

Associated with disease.

1. Leptothrix buccalis.............Saprophytic.
2. " gigantea................. "

GROUP IV. CLADOTRICHEAE.

Possessing cocci, rods, threads, and spirals. Thread-forms provided with false branchings.

Genus, *Cladothrix.*

Genus I. *Cladothrix.*

Species.

Unassociated with disease.

1. Cladothrix dichotoma ....Saprophyte.
2. " Foersteri............. "

Associated with disease.

3. Actinomyces.....................Pathogenic.

This classfication although very defective is the most easily followed and seems to give a clearer view of existing knowlege of schizomycetes than any of the others.

Flügge divides the bacteria into four classes:

1. Fungi
2. Mycetozoa
3. Blastomycetes
4. Schizomycetes.

Most of the pathogenic organisms belonging to the fourth class, he reckons the following as members of this class:

1. Micrococcus
2. Ascococcus
3. Sarcina
4. Clathrocystis
5. Bacterium
6. Bacillus
7. Leptothrix
8. Beggiatoa
9. Spirillum
10. Spirochaete
11. Streptothrix
12. Cladothrix
13. Myconstoc.

Of doubtful relation to the schizomycetes are the crusothrix, sphaerotilus, spiromonas, rhabdomonas, Monas Okeini, and Warmingii vinosa. (Communicated by Doctor Biggs).

The arrangement of Flügge, being the same as that of Rabenhorst, is one of the most recent and is considered as the best by many histologists.

The "classifications of bacteria" are as vary ing and unsatisfactory as they are numerous. A short time ago the suggestion was made, to a distinguished bacteriologist, that it would be very desirable to establish a uniform nomenclature and classification of microbia. He replied that the time had not yet come for this, because knowledge on the subject of bacteria is insufficient to permit of such classification.

A similar reply has often been made in connection with the classification of diseases. The proper time, however, to begin to classify is always the present, for, it should be remembered that to think is to classify. But to classify well requires of the thinker that he shall think well; and well directed thoughts are likely to lead to great advances.

If the bacteriologists should decide to work in unison and in harmony with the single purpose of advancing science, setting aside all personality, the first and wisest step to take would be, after having agreed upon a proper basis and method of nomenclature and classification, to describe fully and accurately the known bacteria, then carefully analyze the descriptions, and deduce therefrom the definitions which will almost invariably furnish correct names. Thus they would establish a uniform and true classification which would be understood by the whole profession.

The outcome of the needed investigations would be the proper construction of the genera, the gathering together of the species, the relegation to the lower rank of varieties, of many that now stand as species, and the discovery of new species. Much greater advances would thus be made than by waiting indefinitely for "the proper time to come." Then the clinicians would be able to use to advantage the knowledge attained of the nature and pathic properties of these deadly enemies of suffering humanity.

The study entailed by the preparation of the summary of the present state of knowledge of the bacteria, ptomaines, leucomaines and "extractives," has led to the following conclusions:

1. That pathohistology needs to be reconstructed on the basis of bio-chemistry.

2. That hygiene should be given a position of much greater importance that it has ever occupied.

3. That prophylaxy should be placed on a firmer footing than heretofore.

4. That the State should come in aid with money and laws, to further the views of the medical profession in the means proposed for preventing disease and hindering epidemics.

5. That therapy should be subjected to many

modifications, in correspondence with the great advances in pathohistology.

6. That the junior student (the Doctor of the future) should devote more time to laboratory work, and to experimental medicine, and should be more thoroughly trained to methods of precision than in the past.

II. Disturbances in the Circulatory Apparatus.

1. Ischaemia, from *ἴσχειν*, to check, to restrain, and *αἷμα*, blood, signifies arrest of blood, and is employed only in the sense of a local disturbance in the circulation. It arises from constriction of the capillaries owing to disturbance in the vasomotor nerves. The plugging of an arteriole is also a factor in the production of ischaemia. It is too, the effect of frost-bite of the tips of the toes, fingers, ears or nose. The result of ischaemia is local capillary anaemia which may be followed by colliquative necrosis in certain tissues, and in others by moist or by dry gangrene.

If there should not be sufficient constriction of the capillaries to arrest the circulation in a given part, but enough to interfere with nutrition, the condition would be one of local capillary *hypoaemia.*

The term ischaemia has been improperly used to designate "local arterial anaemia," and also the "retention or suppression of an habitual flux of blood as of the haemorrhoidal, menstrual, flux, or of epistaxis."

2. Athroisaemia,—from αθροισμα, accumulation, and αἷμα, blood,—signifies blood accumulation, congestion. It is a more exact term than congestion which is applied alike to the accumulation of any other fluid. The French employ the term engorgement to designate the state of a part gorged with blood or some other fluid. The words synathroismus, haemostasia and many others have been suggested to take the place of congestion. But some of them are used in different senses, as for instance haemostasia which, besides signifying stagnation of blood, is made to do duty in designating a means to arrest haemorrhage; haemostatic being derived therefrom.

"Congestion,—from *congero*, I heap up,—is defined as the accumulation of blood in the blood vessels of an organ."

"Active congestion expresses the condition of overfulness of blood vessels arising from paralysis of the vaso-motor and increased energy of the vaso-dilator nerves, such as occurs in the surface redness of active exercise, or in the early stage of inflammation." "Passive congestion—from *pass-*

ivus, suffering,—is an overplus of blood in the capillary vessels of a part, associated with impairment of the vital relations between the blood and the minute elements of the texture, as the cause of the sluggish flow of blood in the capillaries." (Aitken.)

These descriptions are good and clear, but there is no syllable in the word congestion to indicate that it is the blood which is heaped up.

3. Phlegmasia; inflammation. (See p. 52.)

4. Lymphexosmosis signifies a transudation from lymph-vessels.

5. Lymphorrhagia signifies a flow from a rent lymph-vessel. Rhagia has been wrongly applied exclusively to flow of blood. It simply means a breaking forth, and may therefore be used as a terminal to lympho as well as to haemo.

6. Haemorrhagia signifies a flow from a rent or cut blood vessel.

7. Haemodiapedisis signifies an oozing of blood through the walls of vessels. This is commonly but wrongly confounded with haemorrhage which always implies a solution of continuity.

8. Thrombosis,—from *θρομβος*, a clot, and *ωοις*, —signifies coagulation. The coagulation may take place in a blood vessel, or in the heart;

hence angiohaemothrombus, cardiohaemothrombus.

9. Embolismus, from εμβολος, a plug—signifies simply plugging. An angioembolus is a vessel-plug.

III. Pathengenetic Alterations of Structure.

The terms pathogenetic and pathengenetic should not be confounded. Pathogenetic is an adjective signifying that which generates, disease generating, while pathengenetic,—from εγγενης, sprung from,—signifies that which is generated, engendered by disease. In other words a pathengenetic affection is a disease which has sprung from, or has been engendered by a preexisting disease. This word was suggested by Doctor Alfred L. Carroll. (See p. 56.)

1. Hypertrophy,—from υπερ, over, above,—signifies over nourishment, and is here used in its true meaning of increased nutrition and not increased bulk. (See pp. 53–55.)

2. Hypotrophy, — ὑπο, under, — signifies decreased nutrition, and is here employed in its strict sense of diminished nutrition. (See pp. 53–55.)

3. Auxesis is used in the sense of enlargement,

increase, and is substituted for hypertrophy. (See pp, 52–55.)

4. Ectasis signifies dilatation, expansion. (See p. 57.)

5. Stenosis signifies contraction, stricture. (See p. 56.)

6. Ecmasis signifies obstacle, obstruction. (See p. 57.)

IV. Retrograde Metamorphoses.

1. Necrosis, —from *νεκροω,* I kill,—signifies death. As it is here used, death of a part. The following are the principal necrotic processes named by the pathoanatomists: Coagulation, colliquative and cheesy necrosis, ulceration, and humid and dry gangrene.

2. Meiosis,—from *μει'ωμα,* decrease,—signifies a decrease in the size of a part which may or may not shrivel. Meiosis is here employed to signify a decrease in the size of an organ, whatever may be the cause of the retrogression. It is offered as a substitute for atrophy which should be used solely to signify cessation of nutrition, in which sense it is a precursor of mortification. (See p. 54.)

3. Degeneration of tissues is their substitution

by subordinate elements, such as granules and fat, and amyloid, colloid, mucoid, hyaline, inoid, and sclerous substances.

4. Infiltration of tissues is the permeation of any texture by a fluid, or by a solid substance in suspension or in solution. Examples: fatty, pigmentary, calcareous, uric, infiltration.

V. Neoplasms.

The name neoplasm was given by Burdach to the new formations whose fundamental tissue he regarded as consisting of morbid cellular substance. Virchow adopted the term, and nearly all pathoanatomists have since done so, in the sense of the morbid growths arising from simple division or from endogenous multiplication of preexisting cells.

It has been questioned if, strictly, there can be, in the human body, such a development as a new-growth. In reality the growth is new to the particular part whence it springs, though it may be composed of the same tissues that exist normally in this part. In this sense it may be said that the new-growth must be composed of tissues lying within the possibilities of the individual. In the other sense it must be entirely foreign. The examples given are: (1,) a growth composed of feathers would be a new-growth in man; (2,) a growth composed of hairs would be a new-growth in a bird. But some histologists would say there are, in this sense, strictly new-growths in man, e. g., actinomycosis, rhinoscleroma, etc., which are not even composed of animal substances, but of vegetable microörganisms.

The term neoplasm cannot yet be rejected when used in the sense of a growth representing the excessive development of tissues which are identical with or, at least, resemble those of the normal constituents of the body. "Though the cells of human neoplasms may deviate in their appearance from the cells of normal tissues, this deviation is not so extreme that their analogues cannot be met with in some parts of the normal body during intra or extra uterine life."

It may be of interest to trace, from the early writers, the history of the development of the present knowledge of neoplasms, which were called tumors and are still so named by many pathoanatomists. Paul Broca, in his, "*Traité des Tumeurs*" (1866), has given a more full and complete account of this development than most other authors. The following is therefore, in part, abstracted from his classical work.

The word tumor, which Broca uses under protest, signifies, he says, in its most general acceptation, any increase of volume, abnormal prominence, or new production, apparent or concealed, internal or external.

The ancients, and their followers until the renaissance, and even many during the seventeenth and eighteenth centuries, have divided the tumors into three great groups: *tumores secundum naturam, supra naturam, praeter naturam.* These terms were accepted by all but with no consense as to the exact signification which they should bear. In the first group were placed the impregnated uterus, and the consequent enlargement of the mammae. In the second group were included those tumors arising from the displacement of natural parts, such as fractures, and dislocations of bones, etc. In the third group were the tumors that arise, not from the natural parts, but from the development of new tissues or the accumulation of the humors. This last group formed one of the grand divisions of surgery.*

* The surgical Pentateuch was divided into five books: (1,) Wounds; (2,) Ulcers; (3) Fractures; (4.) Luxations; (5.) Praeternatural tumors. The fifth book constituting more than three-fourths of surgery. In it were placed, dry gangrene, skin diseases, and all other maladies that could not enter into the first four books. Galen wrote of *Tumores praeter naturam*, and, says Broca, this Galenic doctrine is reproduced in several of his other works. Tagault's, *In-*

Thus in this fourth group the most dissimilar diseases were placed side by side, simply because, according to the Galenic doctrine, they were supposed to spring from the same causes. All the praeternatural tumors were said to arise from the accumulation of one of the humors of the economy, hence they were also called humoral tumors. They resulted either from fluxion or from congestion.—Fluxion occurred when a natural humor was attracted to, and remained in, the affected part, and congestion when the humor was engendered *in loco.* The humors enumerated by the Galenists were four: (1,) the blood; (2,) the bile; (3,) the phlegm; (4,) the atrabile or melancholy. Giving rise to phlegmons, erysipelas, oedema, scirrhus. Later a fifth was added, the windy humor, which produced emphysema or pneumatosis (inflation). Then there were mixed tumors, those caused by two or several humors.

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stitutiones Chirurgicae, Paris 1543, contains a book, *De tumoribus praeter naturam.* This author appears to be the first to give an analytical classification of tumors which he groups in accordance with the five species of humors; the fifth species being the windy humor, producing *inflationes.* Broca traces down to Didier, of Montpellier, 1711, the ancient arrangement of tumors into the three groups, the last of which being *tumores praeter naturam.*

Humorism was succeeded by solidism, and this latter doctrine, in its turn, was overwhelmed by the advances of anatomy, and the *tumores praeter naturam* ceased to exist after phlegmons, erysipelas, oedema, and emphysema were removed from the group. The term tumor whose nosographical acceptation became more restricted, was finally reserved to designate accidental productions, in the organism, characterized by the formation of new tissue.

The Galenists supposed scirrhous tumors to spring from the accumulation of atrabile. The innovators of the seventeenth century failed to find this mythical humor, but discovered lymph which served to establish a new theory of tumors. It is plain that the solidists were humorists without being aware of the fact, for they thought most tumors due to the extravasation of lymph; that their various forms, and their various terminations, resulted from the different degrees of crudity, coction, acidity, alcalinity, density, acrimony, depravation, or fermentation of this capricious humor; and that these phenomena varied as the lymph was naturally more or less thick, or stagnant, and that the affected part possessed greater or less heat.

While the theory of the day ascribed to most tumors a common cause, the practical physicians discovered great diversity instead of the pretended unity of cause. Under the sway of the atrabile theory also this contradiction had become apparent, and, to escape from the dilemma, the foundation was laid of a doctrine more likely, as it was thought, to be adopted. The atrabile theory was so vague that it possessed an almost indefinite elasticity in the minds of its promotors and yielded to all their fancies. Lymph, on the contrary, had a real existence, had been seen and analyzed, and though the characters attributed to it were far from being exact, they were formulated with precision. One of these characters was its coagulability by heat, and the appearance of a scum at the surface of the water in which tissues impregnated with lymph were boiled. The anatomical study of tumors consisted in boiling them, and, as nearly all furnished a scum, it was concluded that they were of lymphatic origin. This experiment was believed to establish the unity of cause of nearly all tumors. This unity of cause granted, it was necessary to explain why it was that some of these tumors were benign and others malignant. The promotors of the theory then had recourse to the hypothesis of degeneration, that is to say, the transformation of benign into malignant tumors by reason of the depravation of the lymph. The

Galenists had already offered a similar explanation, for they regarded cancer as inflamed or degenerated scirrhus. But the adherents of the lymph doctrine applied the degeneration hypothesis to all, even to scrophulous and lipomatous, tumors, to cysts and to wens. The degeneration hypothesis seems to have been a compromise between the lymph theory, and clinical observation which proved the diversity as against the unicity of cause of tumors. This hypothesis was admitted by all without inquiry as to its actual or possible demonstration. The Galenists had invented it to save the atrabile doctrine, and the solidists to save the lymph doctrine. This degeneration hypothesis has survived the wreck of the two doctrines, and exists in the minds of many unto this day, as do other false doctrines.

Such were the vagaries of the seventeenth and eighteenth centuries respecting the nature of tumors. The first step in advance was made by Littre who, in 1704, discovered a certain tumor to be composed of adipose tissue. Afterwards, in 1709, he proposed that tumors of this genus be named lipomata. Here then was a distinct demonstration of an abnormal development of a normal tissue. But as this was contrary to the existing doctrine, no attention was paid to the statement. Soon after, new observations showed that other tumors were formed, by the morbid increase of preexisting elements, without the intervention of extravasated lymph. It was particularly the study of encysted tumors and wens which led to this conclusion. Astruc and others thought that these tumors resulted from the dilatation of lymphatic vessels. Louis rejected this hypothesis, and said that cysts were formed in the cellular tissue, their walls being composed of condensed cellular and not of a new tissue. In 1775, Girard attributed the formation of sebaccous cysts to the obliteration of the ducts of sebaccous glands. So that gradually, cysts and wens were removed from the category of degenerating tumors, since they were supposed not to be of lymphatic origin. Finally scrophulous tumors were also removed from this category. Then all the other tumors were united in a single group under the name of fleshy tumors, by the advocates of the lymph theory. The extravasated and hardened lymph caused scirrhus, and when this lymph fermented the scirrhus was changed into cancer. Certain tumors were supposed to remain scirrhous and therefore benign, some were transformed into cancer and were therefore malignant, while others were cancerous and therefore malignant from the beginning. All this depended upon the freaks of the lymph. There was no pathoanatomy in those days, so this confusion respecting tumors is not to be wondered at. Still some advance was made, though of a negative character, for it consisted in the elimination, from the group, of morbid states which were not properly tumors.

The question what is cancer, was put by the Academy of Lyons, and a prize offered for some approach to its solution. Peyrilhe to whom, in 1773, the prize was awarded, announced as his conclusion that it was as difficult to define as to cure cancer.

John Hunter gave the last stroke to the degeneration theory, and though his was also a lymph theory, it was of another kind of lymph. The lymph of the solidists was a dead substance cast away by the lymph vessels, a foreign body which underwent fermentation, etc., but that of Hunter was a transudation, from the blood-vessels, endowed with the property of coagulating and of becoming organized. Here then is an implied suggestion that tumors might be regarded as organs superadded to the economy, for he considered that their tissues were nourished, as the tissues of the normal parts of the body, and increased in size by virtue of this nutrition. In his "*Lectures on the Principles of Surgery*," he defines a tumor as "a circumscribed enlargement in a part from disease; not strictly a disease of a natural circumscribed part, as a thickened diseased gland." Tumors, he says, "seem to depend on an accumulation of extravasated coagulable lymph, either in the adipose or cellular membrane or both....... The increase of cancer is much in the same way." He divides tumors into solid and encysted. Solid tumors are subdivided into "three species: (1,) Warts; (2,) Polypi; and (3,) An entirely new substance in the cellular membrane, often irregular, and attached by loose cellular membrane to the surrrounding parts." Among the encysted tumors he places hydatids and most of the known cysts. He classes tubercles under the head of "spurious tumors."

The advent of Bichat, and of his creation of general anatomy, from which pathoanatomy issued, changed, much for the better, the aspect of the question of tumors and gave a basis for their classification. His premature death did not retard the progress of general and pathoanatomy, because he had inspired his disciples with his own great zeal in the pursuance of these newly created departments of anatomy. Laënec was the foremost of his followers in the application of anatomy to the study of disease. It was in December 1804 that he produced the "*note sur* *l'anatomie pathologique*." This was the starting point of general pathology.

Laënec divided accidental tissues into two great categories: (1,) Those having analogues among the normal tissues; (2,) Those having no analogues among normal tissues. Since then, for brevity, they have been designated as homologous and heterologous tumors.

He reckoned as many homologous tumors as there are normal tissues: i. e. osseous, fibrous, fibro-cartilaginous, cartilaginous, cellular or adipose, horny, etc., and added hairs produced in certain cysts, the adventitious serous membranes discovered by Bichat, and giving rise to certain encysted tumors, etc.

Of heterologous tumors he numbered four: (1,) Tuberculous; (2,) Scirrhous; (3,) Encephaloid; and (4,) Melanotic.

He used the term encephaloid to designate those soft cancerous tumors which, on gross inspection, bear a resemblance to cerebral substance. It will be remembered that, even then, soft cancers were, by many, regarded as degenerated scirrhous tumors, still believed to be benign. He declared that the two types—encephaloid and scirrhus—remained distinct from first to last, and that they were composed of tissues which were never interchangeable. While on the one hand this statement was an advance, disposing as it did of the question of fermentative degeneration, on the other hand it still left a doubt as to the real character of scirrhus. Encephaloid and scirrhus being regarded as two different diseases, and the former being cancerous, the nature of the latter should have been, but was not, stated. What added to the existing confusion was that the two diseases had been found in the same individual, and that, aside from the difference in physical appearance, the symptoms of the two were analogous, they showed the same tendency to recurrence, and their termination was the same. Clinical observation and pathoanatomy were apparently at varience. The microscope had not yet come in aid to settle the vexed question. It will not seem strange then that the doctrine of Broussais, ascribing to inflammatory action the formation of all tumors, should have been so readily embraced. At length however it was abandoned and even the most devoted of Broussais' pupils returned to Laënec's classification.

While the French were endeavoring to solve certain questions connected with tumors, the English were laboring in the same direction. John Hunter had given the right impulse to the cancer question, and his successors were striving to determine which of the many tumors should be classed as malignant, and which benign. Among these men were Sir Everard Home, William Hey, Samuel Sharpe and John Abernethy.

In the beginning of this century there was founded in London a "Society for investigating the nature and cure of cancer." That society then appointed a committee, consisting of Doctors Baillie, Sims, and Willan, Messrs. Sharpe, Home, Pearson and Abernethy, with Doctor Denman as Secretary, charged to prepare a programme consisting of thirteen queries relating to the nature, diagnosis and management of cancer. These queries to be answered by the profession at large. The programme was issued in the year 1802, and was reprinted in the Edinburgh Medical Journal, July 1806. The effort was fruitless, and the society soon ceased to exist, but individuals continued the work; among them, Hey, Burns, Home, Wardrop, Abernethy and Lawrence.

"Fungus haematodes" regarded as non-malignant by Hey, Burns and Wardrop and as malignant by Young, was confounded with erectile tumors by Maunoir, and was not, for a long time, classed as a variety of encephaloid carcinoma. Hey and Burns were the first to call attention to these pulsating tumors containing extravasated blood; then Wardrop, Else, Bradley, Young, Travers and Sir Astley Cooper, contributed each his share to their study.

John Abernethy * appears to have been the first to propose an anatomical classification of tumors, Laënec's contribution having been made several months later (December 1804). Abernethy believed that a proper understanding of the subject could be attained only by associated labor,—but this was, for the time, rendered impossible by the dissolution of the Cancer Society,—and undertook his task with the modest statement that, though imperfect, his arrangement would, he hoped, awaken the attention of many others to the question.

He defined a tumor as a swelling due to some new growth, and excluded mere enlargements of natural parts. He divided tumors into several genera, the first genus being sarcoma to which he devoted the greater part of his study. He adopted this ancient word to designate those growths having a "fleshy feel," and recognised eight species:

1. Common vascular sarcoma; 2. Adipose sar-

* John Abernethy; Surgical Observations. Containing "An attempt to form a classification of tumors according to their anatomical structure." London 1804.

coma; 3. Pancreatic sarcoma; 4. Cystic sarcoma; 5. Mammary sarcoma; 6. Tuberculous sarcoma; 7. Medullary sarcoma; 8. Carcinomatous sarcoma.

One genus included osseous and cartilaginous tumors. Another genus the cysts.

Then followed the labors of Lawrence who removed from the category of cancer "benign fungus" of the testicle, of Sir Everard Home who regarded the so called scirrhus of the prostrate as simply a general or partial enlargement of that body, and of Sir Astley Cooper who excluded from the class of cancers certain enchondromata, tubercles of the testicle, etc.

Cruveilhier, Rokitanski, Velpeau, Walshe, and others of their day, contributed largely to the literature and knowledge of tumors, but that which afforded the greatest aid in their study was the advent of the cell-doctrine of Raspail (1825) and Royer-Collard (1826–28), rendered possible by the application of the compound achromatic microscope (1824) to the study of the human tissues in health and disease. Most of the old questions so long in debate were then surrendered for what became tangible and visible. From that time many entered the new field of investigation and there soon appeared exhaustive works on normal and pathohistology, among which may be cited those of Mandl, Hassall, Lebert, Wedl, Vogel and Kölliker. Finally Virchow's cellular pathology came as a beacon to give the brighter light that guided the patho-anatomist in the right direction to further research. Cohnheim's publications represent the advances which Virchow's labors had suggested, and the recent discoveries in embryogeny now come to sustain the modern school of patho-histology and serve to explain and strengthen Müller's aphorism, propounded in 1838, and adopted by this school, to the effect that the substance of all tumors has its analogue in some tissue existing normally in embryonic or after-life.* This is known as the law of Müller.

Virchow, who published his lectures on tumors long before the views of Waldeyer and Duval were known, adopted the law of Müller, and constructed the following arrangement of "tumors," dividing them into four groups.

1. Tumors formed at the expense of the elements of the blood, for example haematomata, etc.

2. Tumors formed by the retention of the pro-

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* In 1804 Laënec had recognised some tumors having analogues among the normal tissues, but Müller advanced a step farther in declaring that the substance of *all* tumors has its analogue in the normal economy.

ducts of secretion, those which result from the dilation of secreting cavities, due to retention of the product of secretion of the glands, for example, glandular cysts, hygromata, etc.

3. Tumors which result from the proliferation of the elements of the primitive tissues of the organism. This class is divided into *histioid* tumors formed by a single tissue, *organoid* tumors, which reproduce the configuration of an organ, and *teratoid* tumors, resembling by the assemblage of different organs, an incomplete being. Each of these classes is itself divided and sub-divided.

4. The fourth group comprises *mixed* tumors, composed of the elements of several of the preceding tumors.

The high reputation of this great Master in pathoanatomy has caused his nomenclature and classification of tumors to be largely accepted by the profession without question. This classification answered a good purpose twenty-five years ago, and was a forward step, but the advances since made in pathohistology forbid its continued use. Nevertheless, there are many physicians and surgeons who still adhere to this arrangement of tumors. In the present light of science, probably no one sees better than Professor Virchow the faults of this as well as of all other classifications, and if his occupations should permit him to undertake its reconstruction, he doubtless would do so consistently on the anatomical basis which does not abrogate, but rather enforces, Müller's law. He would probably abandon the word tumor, and reject the haematomata and also the cysts. He would drop the terms histioid and organoid, place the teratoid growths under the caption terata, and make a very different disposition of the mixed growths of his fourth group.

Förster has arranged tumors into three groups as follows:

1. "Tumors formed of a simple tissue, and sometimes even of a single element of this tissue; for example, fibroma, osteoma, etc.

2. "Tumors having a complex arrangement, the analogue of which can be found in the economy: for example, papilloma, cyst.

3. "Tumors formed of cells having their analogues in the economy, but arranged in a manner other than physiological. This group includes sarcoma, carcinoma, epithelioma, lymphatic tumors, under which may be classed the organic lesions of typhoid fever, tubercle, syphilitic gummata, and true lymphoma."

This arrangement is confusing and unsatisfactory, for genera belonging to entirely different orders are grouped together, and lesions of typhoid fever, tubercle, and syphilitic gummata are included among tumors and placed in the third group amidst pathic conditions to which they bear no relationship.

Broca,* in his classification, goes back to Laënec's two categories: homologous and heterologous tumors, and begins with the following propositions:

"1. All heteromorphous tumors are heterologous. Ex.: cancers;

"2. All homologous tumors are homoeomorphous. Ex.: lipomata;

"3. There exists a third category of tumors which are at the same time homoeomorphous and heterologous. Ex.: epitheliomata.

"Therefore all accidental productions may be divided as follows:

"1. Heteromorphous tumors.

"2. Homoeomorphous tumors: a, heterologous; b, homologous.

He includes in his classification of "accidental productions" many morbid states which do not properly belong to the class tumors as the following synopsis will show.

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* *Traité de Tumeurs*," Paris 1866. Vol. I.

BROCA'S CLASSIFICATION OF THE "ACCIDENTAL PRODUCTIONS."

CLASS I.—HOMOEOMORPHOUS PRODUCTIONS.

Divided into: Homologues, 1st sub-class; Heterologues, 2nd sub-class.

Sub-class I.—*Homoeomorphous and homologous productions.*

Divided into two orders: A. Accidental productions formed by the hypertrophic development of the organs or of their elements. B. Accidental productions of new formation.

A. Accidental productions formed by the hypertrophic development of the organs or of their elements.

1. Hypertrophy affecting at the same time, and in a manner about uniform, all the elements of the organ: Simple, general, or regular hypertrophy.

Simple Hypertrophy.	a. diffused.	Hypertrophy of the glands, lymphatic glands, muscles, heart, mucous membranes, skin, sub-cutaneous cellular tissue (*elephantiasis*), bones (hyperostosis), of certain organs such as the clitoris, the labia minora, the tongue, etc.
	b. circumscribed.	Of the muscles (very rare), tendons (*nodus*), epidermis (corns, callosities), skin and sub-cutaneous cellular tissue (pedunculated elephantiasic tumors), mucous membranes and sub-mucous cellular tissue (mucous polypi, condylomata, hypertrophy of the pylorus, etc.).

2. Hypertrophy affecting unequally the several elements of a complex organ, one of these elements often developing itself at the expense of the others: Partial or irregular hypertrophy.

Partial Hypertrophies.	a. Of the skin.	Occupying particularly the papillae (warts). Occupying certain parts of the derma (condylomata). Occuping the sebaceous or the sudoriparous glands.
	b. Of the mucous membranes	Occupying the papillae (cauliflower vegetations of the external genital organs, of the cervix uteri, of the maxillary sinus, etc., granulations of the conjunctiva ?). Occupying the mucous glands and follicles.
	c. Of the glands, (Adenomata.)	a. Irregular hypertrophy occupying a part or all of the lobes of an acinous gland (uniglandular adenoma or adenoid tumor) of Velpeau. b. Hypertrophy occupying many small glands comprised in the same region. Transition to heterology (multiglandular adenomata, polyadenomata or glandular cancroids of the sebaceous, sudoriparous, uterine, labial, and rectal glands, etc.).

B. Homoeomorphous and Homologous productions of new formation.

That may be divided into two groups, according as their autogenous elements are compound or simple.

A. Compound elements.	a. Tumors formed principally of vessels or of sanguineous cavities whose parieties are similar to the parieties of the vessels.	Erectile Tumors.	Arterial. Venous.
	b. Tumors formed of a tissue analogous to that of the uterus, that is to say of fibrous tissue and of fibro-muscular cells.	Hystero-mata.	Fibrous tumors of the uterus and of the neighboring regions.
	c. Tumors formed of one or of several homoeomorphous and homologous membranes, which circumscribe one or several cavities.	Cysts.	1. Cysts developed in preexisting cavities (progenetic cysts). 2. Cysts of entirely new formation (neogenetic cysts).
	d. Tumors formed of the transitory or definitive tissues of the teeth.	Odontomata.	

B. Simple elements. Productions formed:

- a. of adipose tissue....
  - a. Diffuse.—Fatty infiltration of the organs.
  - b. Circumscribed.—Lipomata.
- b. of osseous tissue....
  - a. Reparative ossification.......... — Callus, new bone of necrosis, etc.
  - b. Idiopathic ossification — Osteomata
    - 1. In continuity with the bone (exostoses and osteophytes).
    - 2. Without continuity with the bone (free bony tumors).
- c. of cartilaginous tissue ....chondromata
  - Of the skeleton.
  - Of the soft parts.
- d. of fibrous or connective tissue or of fibro-plastic elements, transitory, passing promptly into the fibrous state.
  - a. Productions of traumatic or of inflammatory origin. — Cicatrices. Inflammatory induration. Organized false membranes. Fibrous knobs of nerve trunks after amputation.
  - b. Idiopathic productions forming circumscribed tumors. — Fibromata.
- e. Epithelial elements, forming a particular tissue, without mixture of other elements. Transition to heterology. — Horns.

Sub-class II.—*Homoeomorphous and heterologous productions.*

1. Fibrous and fibro-plastic elements in about equal proportions..	Keloides. Warty tumors of cicatrices. Anatomical tuberculous tumors. Certain fungi of the dura mater.
2. Autogenous and permanent fibro-plastic elements ....Fibroids.	nuclear. fibrillary.
3. Autogenous epithelial elements.... Epithelioma.	of the skin. of the mucous membranes.
4. Disks with multiple nuclei or myeloplaxes forming the autogenous element..................	Myeloids.
5. Autogenous pigmentary elements.	Simple melanosis (rare in man, common in the horse).
6. Elements of entirely new formation imitating the form of glandular culs-de-sac, but forming a heterologous tissue...	Pseudadenomata (or heteradenomata.)

CLASS II.—Heteromorphous Productions (all are heterologous).

A. Accidental productions forming part of the economy.

1. Tumors of a high organization, and of a greater or less vascularity of their own, containing specific elements called cancerous elements, pure or mixed with adventitious elements: Cancers.

2. Tumors of a much lower organization, deprived of vessels and containing specific elements called tuberculous elements: Tubercles.

B. Accidental heteromorphous production which does not form a part of the economy: Pus.

CLASS III.—Amorphous Productions.

Deposits:	of gelatiniform matter	Simple colloid.
	of very small corpuscles which belong neither to nuclei nor to cells	Syphilitic gummata.
	of coagulated fibrin, without tendency to fibrous or fibro-plastic organization	Active clots of the arteries or of aneurysms.
	of fat granules, cholesterin crystals, sundry crystals, and calcareous and other inorganic salts	Cretacious, atheromatous, calcareous, and tophic deposits, etc.

CLASS IV.—Encysted Parasitic Animals.

Hydatids.

Cornil and Ranvier make some improvement on the preceding arrangements, but instead of gathering together like genera, they rank as orders several of these genera. They divide the "tumors" into ten groups as follows: *

Group I.—"Comprises tumors formed of a tissue analogous to embryonic tissue. We might employ a new word to indicate this analogy, but we prefer to make use of the old word sarcoma, though it has been employed in very different senses by different authors. This group only contains one genus, sarcoma, of which there are a great number of species and varieties.

Group II.—"Contains tumors formed of a tissue, the type of which is found in connective tissue. This tissue is sometimes mucous, and the tumor is called myxoma, sometimes fibrous and called fibroma (Verneuil), or inoma, from ἰνός, fibre (Paget), sometimes adipose, when called lipoma. In some cases the tissue undergoes hypertrophic aberration affecting the size of the cells; this is the case in carcinoma, which

* Cornil and Ranvier, Manual of Pathological Histology, second edition. Translated by A. M. Hart. London 1882. No change in Cornil and Ranvier's classification of tumors has been made since their first edition which was published in 1869.

would be better called alveolar fibroma; in others, the cells atrophy, as in tubercle, glanders and syphilitic gummata. This second group therefore contains the varieties myxoma, fibroma, lipoma, carcinoma, tubercle, glanders, and syphilitic gummata.

Group III.—"Contains tumors formed of cartilaginous tissue, of which there is but one genus, chondroma.

Group IV.—"Is composed of tumors formed of osseous tissue, osteoma.

Group V.—"Tumors, formed of muscular tissue or myoma, are divided into two kinds, according as the fibres of new formations are striated or non-striated: myoma of striated fibres, myoma of non-striated fibres.

Group VI.—"Tumors formed of nervous tissue are of two varieties: the medullary neuroma containing nerve cells, and the fasciculated neuroma containing nerve tubes.

Group VII.—"In this are tumors formed of blood-vessels, or angioma.

Group VIII.—"Contains tumors composed of lymphatic vessels, lymphangioma, and those which reproduce the structure of lymphatic glands, lymphadenoma.

Group IX.—"Contains tumors composed of

epithelium of new formation. They are divided into four varieties according as the cells are arranged in irregular masses, epithelioma, or in papillae, papilloma, or in culs-de-sac, adenoma, or in cavities of new formation, cysts.

Group X.—Contains mixed tumors, containing a great number of tissues; they are found specially during intra-uterine life."

Cornil and Ranvier* say "We..... wish to treat simply from the histological point of view, and have therefore included under the head of inflammation and haemorrhage what seemed to us to rightly belong to them, blood-tumors, hygromata, for example. We also think we have a right to reproach Virchow with having invented new words, drawn from gross physical characters, whereby to designate certain tumors, instead of employing words representative of the tissues. Thus he uses the word psammoma to signify a tumor of the meninges, because it contains calcareous granules similar to fine sand, and the word glioma is applied to tumors of the brain because they are of a consistency analogous to glue. He thus departs from the classification which Müller's law suggests, and which we intend to follow absolutely."

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* *Op. cit.* pp. 123–124.

At page 125, the same authors write: "The classification of tumors which we propose differs, it will be seen, notably from those hitherto published. It is an anatomical classification. It cannot consequently serve to determine the degree of gravity of a tumor. No anatomical classification can at present answer this legitimate desire of the physician. To determine the degree of gravity of a tumor, knowledge of the order, species, and variety to which it belongs can alone be depended upon. The sole general considera tion, which may be advanced on the subject of the benignity or malignity of tumors, is that the most serious are those which determine the formation of a large quantity of embryonic elements, at the expense of which they grow rapidly. Our classification has the advantage of being purely histological and of being based on one law and on one consideration which seems to us to be supreme, that is, the general arrangement of the morbid tissue and the distribution of the elements composing it."

Cornil and Ranvier, adopting the aphorism of Müller, endeavor to conduct their classification on the anatomical basis, but even at the beginning are inconsistent, for instead of grouping the tumors in accordance with the histogeny of the tissues, they mix connective tissue with epithelial growths; thus they place in group second, inoma, myxoma, lipoma (connective tissue growths), with carcinoma (epithelial growth), and then add tubercle, glanders, and syphilitic gummata, which have no legitimate place in this group. Instead of placing in one and the same group, sarcoma, myxoma, inoma, lipoma, chondroma, and osteoma, which are all connective tissue growths, they scatter them in four distinct groups.

They make varieties of medullary and fasciculated neuromata which are in reality species; and epithelioma and adenoma which are genera are also set down as varieties.

They class papilloma as a variety of epithelial growth, while in truth it is a papillary or villous inoma, and should be so named and not called papilloma. They include too the cysts, which should be placed under a distinct and separate caption.

The mixed tumors, described by them as formed especially during intra-uterine life, belong properly to the teratisms and should be classified accordingly.

This all shows how inconsistent and fallible men can be; even those whose minds are richly stored with knowledge. Therefore nothing in medicine should be taken for granted because uttered by one high authority. Every assertion, theory, discovery, and new method or process, should be put to the most searching tests by many laborers, and, before they are accepted, should pass through the expurgating crucible of criticism which will clear away the dross of error and misconception, and bring forth the genuine glitter of the pure and precious truths of science. This is the right path to advancement.

Hasse thinks that neoplasms probably arise in tissues in different conditions—embryonic, growing, mature, retrogressive. They are regarded as new formations because they are more or less independent of the matrix tissue. They behave like independent, isolated bodies, except that they draw their sustenance from the organism; they have their autonomy, so that they bear no relative increase or decrease of size with the organism. Examples: A neoplasm, in a fat subject, does not decrease in size upon the supervention of emaciation; and a neoplasm, in a lean subject, does not increase in size upon the supervention of corpulency. "The neoplasm assumes properties distinct from its surroundings, the individual elements of the growth become affected in some way and they are rendered dissimilar to their neighbors. There is no limiting or directing influence of the surrounding tissues on the new growth. The result is development of a tissue of abnormal type, a local anatomical misformation."

Cohnheim is of opinion that neoplasms cannot be regarded as localised hyperplasias because they generally differ in their histogenesis from the matrix tissue, and because this histogenesis is so different from the formative processes originating in inflammation. His views of the embryonic theory are substantially as follows: Many forms of neoplasms are developed at all ages, they originate too in apparently normal tissues, and are due to the persistence of embryonic germinal tissues in the otherwise mature organism; taking their rise in what may be called belated rudiments—foci of formative embryonic tissue which have not been utilised in elaborating normal tissues, and so have lingered on unchanged. In other words such a growth is an atypical new-formation starting in a latent embryonic rudiment. The germs of the growth may be very small and elude observation, being embryonic cells, or may be quite recognisable among the normal elements. These germs may long remain inactive, but when external conditions, supply of nutriment, and relation to surrounding tissues are favorable, they begin to multiply, start into a new life and form a neoplasm.* Cohnheim's arguments in favor of his theory have explained the otherwise unaccountable heterogeny of many neoplasms. He says: many new-growths are hereditary; they may exist at birth or develop in infancy; they show a preference for sites where, in early developmental stages, complication of structure happens; where different epithelial formations pass one into the other, as the lips, stomach, anus, and cervix uteri; or where the entire process of development is complex, as the genital apparatus; also the atypical structures.

In order to fully understand the blastodermic theory of the development of neoplasms, it is necessary to pass in review the changes which take place in the human blastoderm. The following, which exposes the most recent views of the subject, is abstracted from Duval's physiology.

"Originally the human organism consisted of a single cell, the ovule, which when fecundated begins to undergo certain transformations, the first of which being segmentation. As soon as the ovule is divided in four segments, these limit between themselves, by their slight separation, a space called the segmentation cavity. As the

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* It is well known how often new-growths take their starting point from traumatisms.

segmentation goes on, this cavity increases more and more, and finally the segmented ovule becomes a hollow sphere whose parieties are constituted by a layer of cells comparable to epithelia. The large cavity circumscribed by this layer of cells still bears the name of segmentation cavity. Then take place transformations which differ somewhat in different animals, but may nevertheless be brought to the following type: that is to say to the formation of a gastrula. One of the hemispheres of the hollow sphere becomes flat, then is gradually invaginated in the interior of the other hemisphere. A new cavity, called the invagination or gastrula cavity, is thus produced, which corresponds to the future intestinal cavity.

"The segmentation cavity is then reduced to a mere chink separating two cellular layers: the one of the layers, which corresponds to the interior of the original intact hemisphere of the hollow sphere, is called the external layer, the other, which corresponds to the interior of the invaginated hemisphere is called the internal layer. Soon the internal layer, by multiplication of its cells, is divided into two layers, one of which being the internal layer proper, and the other the middle layer or mesoblast. The mesoblast therefore occupies a position, in what was the segmentation cavity, between the internal and external layers. Such is the origin and development of the blastodermic vesicle, and such are the relations of its three layers. The epiblast or external horny layer retains its cellular character, and from it is derived the epidermis.

"The entoblast or internal layer furnishes the epithelium of the future intestinal mucous membrane and of that of its annexes, of the great majority of glands, and of the lungs.

"The mesoblast or middle layer. The cells of of this layer undergo much more complicated transformations than those of the other two layers. Some of them are transformed into nerve tissue, into muscle tissue, and into all the forms of connective tissue; others preserve their cellular state, but are changed in form and diffused in the fibrous element of connective tissue, " they are called embryonic or mesoblastic cells—cells of tendous, cartilage, bone— ; the others swim in a fluid—blood cells, etc." *

Rindfleisch and Lancereaux based their classifications of the new-growths upon the derivative tissues of the blastoderm, and divided these new-growths into two great classes; (1,) that in which the generative tissue is derived from the meso-

* Mathias Duval. Cours de Pysiologie. Sixième édition. Paris, 1887.

blast; (2,) that in which the generative tissue is derived from the entoblast and epiblast. The first being formed of connective tissue, the second of epithelium, of epidermis, or of their derivatives. Hallopeau adopted this basis of classification in the first edition of his work, but in the second edition he says: "to-day the soundness of this division may be doubted in view of the late embryogenic researches of Waldeyer, showing that the entoblast and mesoblast are derived from the invagination of the epiblast; in that case the mesoblast has not the same individuality as the others, for, elements of different nature are therein united. Duval had arrived independently at the same conclusion.

In his work on *Physiological Chemistry* (1880), Gamgee, in treating of the epithelium of the mucous membranes, says:

"This epithelium is mainly derived from the hypoblast, though in some cases it takes its origin in the epiblast (epithelium of mouth and salivary glands), in others from the mesoblast (certain portions of the epithelium of the genito-urinary tract). In short, the epithelium of the mucous membranes is possessed of diverse chemical attributes and is developed in several ways; it does not therefore possess any common characters which permit of a general description."

The clinical basis is out of the question because, if an arrangement were attempted on such a foundation, the malignant and non-malignant growths would have to appear under separate heads; for instance, epithelioma and carcinoma would have to be placed in the same order as sarcoma, etc. It would be against all rules of nosography to arrange growths in accordance with their benignity or malignity, for this belongs to prognosis which occupies its proper rank in methodical arrangement.

Rindfleisch still adheres to the blastodermic basis,* and defines a tumor as "an excess of degenerative local development."

The classification which he now promulgates is based upon the duality of the embryonic elements (His.), namely, (1,) *archiblastic* tissues, which, besides the epithelial casing of the epiblast and entoblast, include the muscular and nervous elements that are generally credited to the mesoblast; (2,) the *parablastic* tissues, the products of the peripheric vessel-forming matrix, of the *area opaca* of the embryo, which from the periphery grow into archiblastic layers, and serve to bind them together and nourish them. If, says Rind-

* Ed. Rindfleisch. *Elements de Pathologie.* Traduction Française du Docteur J. Schmitt. Paris 1886.

fleisch, this theory be accepted, a natural and fruitful division of tumors may be made into two groups: "The first group include tumors which are exclusively the products of the intermediary apparatus of nutrition—the primitive parablasts. From the beginning they show their connection with the vascular system, by forming around a vessel a little focus of embryonic tissue rich in cells. This may in time produce the highest types of the tissues of the parablastic series. After this manner are produced lipoma, fibroma, myoma, enchondroma, endothelioma, angioma, etc. But in a great number of cases the neoplasm does not reach full development, and the tumor remains formed of an imperfect connective tissue such as is found in inflammatory neoplasms—connective tissue with round or fusiform cells—this is sarcoma. This imperfect maturation of tissue gives a new criterion of the degree of degeneration, and irregularity of development. In fact the amount of production is in inverse ratio to the perfectness of the tissue. The excessive formative activity seems to have the one object of producing an enormous amount of cells. It is in this way that the disease destroys an organ and pervades the whole economy. In this struggle, the individual development of the cell goes on with difficulty. Still the most exuberant sarcomata have a tendency to reproduce certain characters of the site where they are developed—as ossification, pigmentation, etc.

"The second group includes the epithelial tumors. Here the epiblast and entoblast, either alone or mixed with the parablasts, determine the essential nature of the tumor. Here too are produced many young epithelial cells which rarely reach full development but resemble the epithelial cells which are proper to the site. Thus are formed the subdivisions of adenomata. Much more frequent are the true carcinomata in which the epithelial proliferation is completely atypical and very rapid and abundant, the young cells inordinately accumulating on the chosen ground. Carcinomata and sarcomata, in consequence of this luxuriant cell proliferation, have a common property which allows them to be included in the same clinical group as that of medullary tumors."

It is thus Rindfleisch reaches his classification which is as follows:

Rindfleisch's Classification of Tumors.

Group I. Hyperplastic Tumors.

Site; Bone, Skin, Glands.

1. Enchondrosis
2. Exostosis
3. Verruca
4. Papilloma
5. Hypertrophied glands with equal development of all their tissues.
   a. Lymphoma (lymph-glands, spleen).
   b. Struma hyperplastica (thymus, prostate).
   c. Cysts by retention (atheroma, mucous polyps of the intestines and uterus).*

Group II. Heteroplastic Tumors.

(True tumors).

A. Tumors issued from the vasculo-connective substance—*Parablastic neoplasms* (His). *Histioid tumors* (Virchow).

* Here then is a series of growths which Rindfleisch classifies as tumors, but in the second group (true tumors), is an implied statement that the first group consists of tumors that are not tumors. This, however, is but a venial fault as compared with others contained in this very unsatisfactory classification.

a. Where the tissues reach perfect maturation.

1. Fibroma
2. Lipoma
3. Enchondroma
4. Myxoma
5. Angioma
6. Osteoma
7. Endothelioma.

b. Where the tissues do not reach perfect maturation.

1. Sarcoma
   a. Fusocellular sarcoma (small cells).
   b. Fusocellular sarcoma (large cells).
   c. Simple globocellular sarcoma.
   d. Lymphadenoid globocellular sarcoma.

B. Tumors having their origin in the tegumentary or glandular epithelium (*archiblastic heteroplasms*).

1. Epithelioma
   a. Pavement epithelium tumors,
   b. Cylindrical epithelium tumors.
   c. Glandular epithelium tumors.

There stops this new arrangement of tumors. It is so obviously incomplete, inconsistent, and unsatisfactory that an extended commentary thereon would be superfluous.

Mr. Butlin, excluding the cysts, divides tumors into two orders and fourteen genera as follows: *

I. Connective tissue tumors.	1. Lipoma 2. Fibroma 3. Chondroma 4. Osteoma 5. Myxoma 6. Lymphoma 7. Myoma 8. Neuroma 9. Angeioma 10. Sarcoma 11. Endothelioma
II. Epithelial tumors.	12. Papilloma 13. Adenoma 14. Carcinoma,

Six modern classifications of tumors—all different—, from Virchow to Butlin and Rindfleisch, are given for comparison. If, in the whole range of nosography, there existed only this diversity in arrangement, it would be sufficient to warrant a loud call for a better understanding among investigators, for associated labor, and for a general consense of views in the profession, as the only means to put an end to this confusion of names

* Article Tumors, by Henry Trentham Butlin, F. R. C. S., in the *International Encyclopedia of Surgery*, 1884.

whose outcome has been confusion of ideas. Only one classification of tumors is really wanted and this should be compiled, partly from those now existing, and partly from the new material which must come forth as a result of the study entailed by such compilation.

The foregoing statements render it clear that the law of Müller, or the blastodermic theory cannot stand for the foundation of any classification. However, neither the former nor the latter should be lost sight of, for they both afford great aid alike in the study of morbid growths and in their arrangement. The true basis of the classification should be anatomy in its broadest, most comprehensive sense, leading from biogeny to pathogeny. It is upon this basis, in accordance with the dominant structure in their composition, that the arrangement of neoplasms, (as far as genera), has been made in the table of morbid states and morbific processes, which is offered only as a suggestion of a ground-work for the classification of diseases.

In the table of morbid states and morbific processes Neoplasmata stand for class, and this class is divided into five orders: 1, Desmoneoplasmata; 2, Myoneoplasmata; 3, Neuroneoplasmata; 4, Angioneoplasmata; and 5, Epithelioneoplasmata: and fourteen genera. Thus indicating the tissues of which the growths are chiefly composed.

The first order consists of eight genera; the second order, of one genus; the third order, of one genus; the fourth order, of one genus; and the fifth order, of three genera.

The third genus of the first order is named inoma,—from ἴς, ἰνός, fibre—, as suggested long ago by Sir James Paget. This term is preferable to, because more exact than, fibroma which is a hybrid. However, in the table it appears in brackets.

The fifth genus of this first order is named neuroglioma instead of the original glioma of Virchow. Neuroglioma was used by Klebs, Heller, and Renaut (1885). They employed this word because they thought that the growth contained nerve elements. Ziegler and others denied that neurogliomata contain nerve elements. Hallopeau insists upon the use of glioma because, as he says, it contains no nerve elements.

The term neuroglioma is used here simply because the growth it is intended to designate is composed of *neuroglia*, nerve-glue. Used in such a sense this word will surely not indicate that the growth in question contains nerve elements other than nerve-glue. Glioma is objectionable because it means a growth composed of glue without indicating the kind of glue.

The second order, myoneoplasmata, consists of only one genus, myoma, and this genus of two species, (1,) rhabdomyoma, composed chiefly of striated muscular fibres, and (2,) leiomyoma, composed chiefly of smooth muscular tissue.

The third order, neuroneoplasmata, consists of one genus, neuroma, and this genus of two species, (1,) medullary neuroma, containing nerve cells; (2,) fasciculated neuroma, containing nerve tubes.

The fourth order, angioneoplasmata, consists of one genus, angioma, and this genus of two species, (1,) haemangioma, composed chiefly of blood vessels; (2,) lymphangioma, composed chiefly of lymph vessels.

The fifth order, epithelioneoplasmata, consists of three genera, (1,) epithelioma, (2,) carcinoma, (3,) adenoma. Each genus has its species and these their varieties. Some of these species are now in dispute, and it is hoped that the question of their retention or rejection will very soon be settled. The epithelioneoplasmata may be said to be panblastic,* that is to say that they are de-

* Panblastic (Clymer).

rived from the meso and from the ento and epiblast.

VI. Blastomata.

The reasons for suggesting the term blastoma are given at page 58.

Blastomata are detached from neoplasmata, because of the fact that neoplasmata spring from the normal tissues of the body generally without the intervention of extraneous substances, while the blastomata are now all regarded as infective in character and as proceeding from parasitic invasion. From the point of view of the Bacteriologists, blastomata have a better right to the title neoplasmata than the growths now bearing that name. In the one case the growths are endogenous (native), in the other exogenous, (foreign invaders compelling the organism to build their dwellings which they consume and destroy.)

The seventh genus of blastomata, actinomycosis, is a disease of the lower animals, but it occasionally invades the human body. The parasites actinomyces enter the body with the food taken, and effect lodgment in the tissues of the mouth through an accidental abrasion, multiply, cause inflammation of the surrounding tissues and soon a neoplasm, resembling a tuberculous nodule, is developed which consists chiefly of round cells. The neoplasm may go on increasing in size or may break down and suppurate. In the slimy detritus little pale-yellow grains of the fungus may be detected. The organism may also occur in nodular tumors in the lungs, and subcutaneous and intermuscular tissues. It is the cause of "wooden tongue" and also of diseases which have been described, before their true nature was understood, as bone-canker, bone tubercle, osteo-sarcoma, etc., (Crookshank).

The eighth genus of blastomata, rhinoscleroma, was formerly confounded with syphilis and lupus, but it greatly differs from them in its anatomical characters, and is not in the least degree controlled by antisyphilitic medication. It has been observed in Austria, Hungary, Italy, and Central America. Hebra and Kaposi described it in 1870, and since that time, the subject has been largely discussed, particularly by Mikuliez, Frisch, Chiari, Klebs, Auspitz, Eppinger, Pellizari, Alvarez, and Rindfleisch. (Cornil and Babes).

Rhinoscleroma is characterized by a thickening and induration of the nasal septum and mucous membrane, of the integument of the nose and lips, and of the pharyngo-laryngeal mucous membrane. It begins in the nose and finally invades the other parts. It shows itself under the form of smooth or granulous, hard, elastic, and shiny nodosities of light red or gray color and painful under pressure. These growths extend deeply into the derma and slightly resemble keloides, showing neither hairs nor glandular mouths. The neighboring parts are tumefied, the nose is flattened and enlarged at its anterior extremity; the wings of the nose are stiff and immovable; and the nasal orifices are narrowed. The upper lip is indurated from invasion of the disease which may reach the gums and buccal membrane, at the same time that the infection is propagating itself from the nasal fossae to the palatine curtain, to the pharynx and even the larynx. A glottic stenosis necessitating trachoeotomy may even be the result. The progress of rhinoscleroma is very slow, the primitive nodule may be four or five years in reaching a superficial extent of four or five centimetres. There are cases of fifteen or twenty years standing. (Cornil and Babes.)

According to Auspitz, Alvarez, and Rindfleisch, the skin in rhinoscleroma is infiltrated with small cells, its vessels are selerosed and imbedded in the same cells. It contains also protoplasmic polynucleated giant cells, and also bacteria and hyaline bodies. Alvarez has lately said that he is disposed to look upon these as dilated lymphatics rather than cellular elements.

VII. Cysts.

The cysts are detached from the class neoplasmata because cysts that are not parasitic or teratic are not neoplastic, and the parasitic and teratic cysts should be placed respectively in the classes Parasiti and Terata.

Most of the recent writers upon neoplasms exclude the cysts from the caption neoplasmata. A cyst is a cavity whose contents are circumscribed by fibrous tissue, or some other more or less complex structure, with or without a lining of epithelium or endothelium, according to its genesis.

Sir James Paget* separates the cysts from the tumors, but includes parasitic and teratic cysts in the one class cysts, as have done most other writers.

Mr. Butlin † divides cysts into:

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* Lectures on Surgical Pathology, edited by Dr. Turner.

† Loc. Cit.

I. Cysts formed by distension of previously existing sacs or tubes.

1. Retention cysts.
2. Exudation cysts.
3. Blood cysts.
4. Lymph cysts.

II. Cysts of new formation.

1. Extravasation cysts.
2. Parasitic cysts.
3. Cysts formed in areolar tissue.
4. Cysts formed by union of papillary processes.
5. Cysts from changes in cells.

III. Cysts of uncertain origin.

Are not the cysts (II. 3.) formed in areolar tissue the same as (I. 2.) the exudation cysts, and (I. 4.) the lymph cysts?

Parasitic cysts have no place in II, for they belong properly to the caption Parasiti.

Cysts of uncertain origin (III,) naturally suggest that an endeavor should be made to find the origin of these cysts in order that they be named and rightly classified.

Retention cysts are exemplified by the glandular cysts formed, in preexisting epithelial cavities, by organic or mechanical closure of a gland duct, causing an accumulation of its natural se cretion behind the obstruction, and dilatation into a cyst. The retention cysts occur in the skin, mamma, uterus, intestine, and kidney. Canals lined with epithelium, such as the bile ducts, ureters, vermiform appendix, seminal tubes, etc., develop into cysts by local dilatation from obstruction.

Endothelial cysts are often classed as retention cysts, but are not of that nature. They are properly exudation cysts, and occur either in natural spaces of the connective tissue, such as bursae and tendon sheaths, in false membranes, or in obstructed lymphatics, and their contents, though varying with their mode of origin, consist generally of lymph.

Blood cysts are due to haemorrhage in pre-existing cysts, in closed cavities, or in connective tissue which eventually encloses completely the extravasated blood. They are all therefore blood extravasation cysts.

Lymph cysts, commonly called hygromata, are the same as endothelial cysts, and are the outcome of obstruction of lymph vessels, or of dilatation of lymph spaces. They may also be lymph extravasation cysts.

Degeneration cysts result from a necrotic process. They occur in the substance of organs and sometimes of tumors, and their contents are the products of disintegration of the substance of the organ or of the tumor.

Cysts formed around foreign bodies such as bullets, etc., and around parasites, should be classed under their appropriate captions and not with neoplasmata.

Waldeyer and Malassez regard ovarian cysts as epitheliomata. If this view be correct, such cysts should be classed as varieties of epitheliomata.

CONCLUSIONS.

Among the conclusions drawn from the preceding considerations are :

1. That the systematic arrangement of diseases upon a proper basis must give to medicine an assured position among the sciences ; and that even in its imperfect state, it has contributed marvelously to the advancement of medical art during this century.

2. That the only stable basis for nosography is anatomy.

3. That an accurate description and an exact definition of diseases are essential to a precise and practical nosography.

4. That a nomenclature, to be satisfactory, must not admit the application of the names of men to diseases, or any name which does not convey an intelligible idea of a morbid condition.

5. That the nomenclature of diseases can be much improved only after a very great change for the better shall be made in the fundamental science and associated arts of medicine.

6. That the most useful and practical classification of diseases is that in which these are grouped, in accordance with the apparatuses of the body, into families, branches of families, classes, orders, genera, species, sub-species, varieties, and sub-varieties.

7. That the purpose of the nosographer should be to guide the practising physician to the end of any case of disease.

8. That a complete nosography should include the history, pathoanatomy, diagnosis, prognosis, and treatment of diseases, and for ready reference, should contain not less than five synoptical tables: (1,) a synposis of the morbid states and morbific processes of the body; (2,) a synopsis of the genera and species of diseases; (3,) a synopsis of the classes, orders, genera, species, sub-species, varieties, and sub-varieties of diseases; (4,) a synopsis of the aetical factors of diseases;

and (5,) a synopsis of the symptoms and signs of diseases; also a full alphabetical index.

9. That any system of general nosography, to be of utility to scientific investigators, practising physicians, and vital statisticians, should be the result of the conjoint labors of the medical profession of all the civilized nations of the world.

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