

HAY-FEVER

ITS SUCCESSFUL TREATMENT

HOLLOPETER



SECOND EDITION

NATIONAL LIBRARY OF MEDICINE



NLM 00044900 9

SURGEON GENERAL'S OFFICE
LIBRARY.

Section, _____

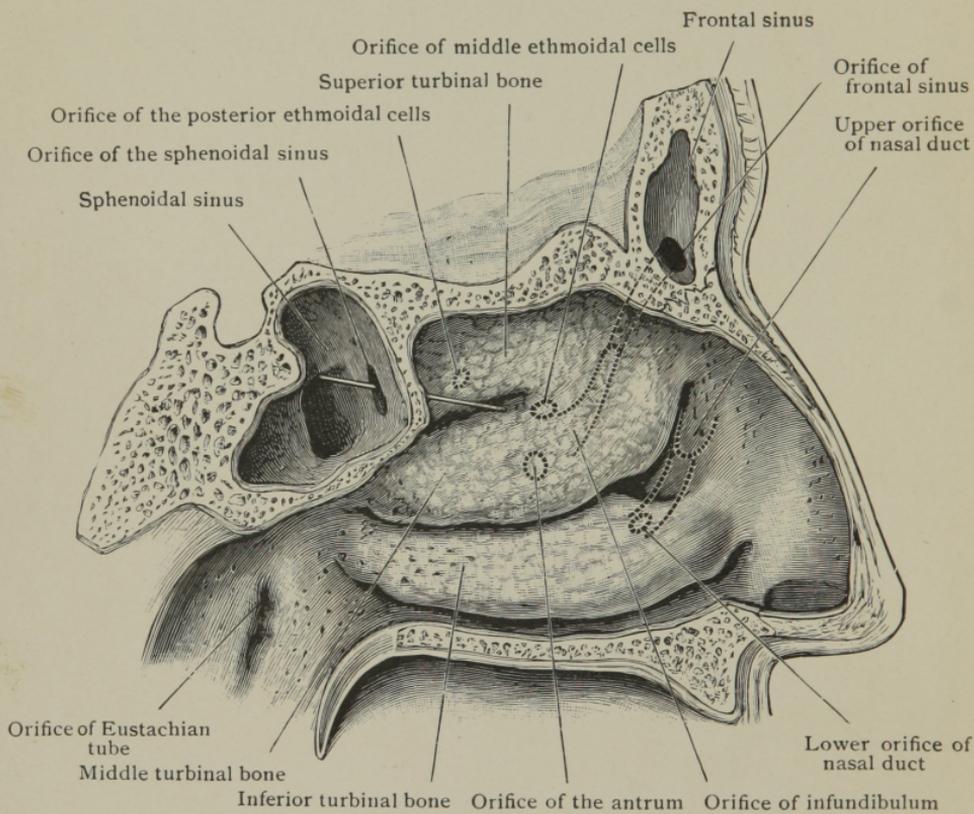
No. 167233.

3-1639

Annex

HAY-FEVER
AND
ITS SUCCESSFUL TREATMENT

HOLLOPETER



SECTION OF THE NOSE, SHOWING THE TURBINAL BONES AND MEATUSES, WITH THE OPENINGS IN DOTTED OUTLINE.

HAY-FEVER

AND

ITS SUCCESSFUL TREATMENT

BY

W. C. HOLLOPETER, A.M., M.D.

CLINICAL PROFESSOR OF PEDIATRICS IN THE MEDICO-CHIRURGICAL COLLEGE
OF PHILADELPHIA; PHYSICIAN TO THE METHODIST EPISCOPAL HOS-
PITAL; PEDIATRIST TO THE MEDICO-CHIRURGICAL HOSPITAL,
TO ST. JOSEPH'S HOSPITAL; FELLOW OF THE AMERI-
CAN ACADEMY OF MEDICINE, ETC., ETC.

Second Edition, Revised and Enlarged

LIBRARY
SURGEON GENERAL'S OFFICE

OCT. -- 7. - 1899

167233.

PHILADELPHIA

P. BLAKISTON'S SON & CO.

1012 WALNUT STREET

1899

Annex
WV
335
H745h
1899

COPYRIGHT, 1899, BY P. BLAKISTON'S SON & Co.

WM. F. FELL & CO.,
ELECTROTYPERS AND PRINTERS,
1220-24 SANSON STREET,
PHILADELPHIA.

PREFACE.

Having had remarkable and uniform success with a simple treatment of hay-fever for the last ten years, during which time I have given complete relief to over two hundred patients in my private practice, and having made a thorough clinical study of this affection, as well as an exhaustive review of the literature relative to it, I feel justified in presenting the results of my labors in this short treatise.

There is little to be said definitely about the etiology of the disease. It is undoubtedly caused by an external irritant, possibly containing a micro-organism or a toxin, which becomes especially active in the nasal passages of an individual predisposed by systemic debility or local abnormality. We acknowledge the element of neurotic disturbance, but to dogmatically define its exact cause and *modus operandi* is beyond us.

In order that the best thought of the subject may be presented to the reader, I have compiled, arranged, and annotated the most worthy literature, and I acknowledge my indebtedness to the many writers quoted. The most of my original communication is devoted to the all-important point in the discussion—the successful treatment. A complete bibliography is appended.

W. C. HOLLOPETER.

1428 NORTH BROAD STREET,
PHILADELPHIA, *July, 1898.*

PREFACE TO THE SECOND EDITION.

Encouraged by the cordial reception of this little monograph, as evidenced by a call for a second edition within a year, the author has endeavored to revise and enlarge the text so as to include the special treatment of each of the various types of hay-fever cases. The bibliographic section has also been brought up to date.

W. C. HOLLOPETER.

1428 NORTH BROAD STREET,
PHILADELPHIA, *June, 1899.*

TABLE OF CONTENTS.

	PAGE
SYNONYMS,	9
DEFINITION,	10
GENERAL REMARKS,	12
HISTORY,	18
EXCITING CAUSES,	30
Heat,	30
Light,	32
Dust,	34
Ozone, Benzoic Acid, etc.,	35
Various Other Exciting Agents,	36
THE POLLEN THEORY,	41
PREDISPOSING CAUSES,	47
Race,	47
Geographic Distribution,	49
Heredity,	52
Sex,	54
Age,	55
Education,	55
Occupation and Mode of Life,	56
The Neurotic Theory,	57
Vasomotor Susceptibility,	59
Idiosyncrasy,	60
Local Disease Theory,	62
The Uric Acid Theory,	64
Defective Nutrition,	68
Gastro-intestinal Causes,	71
TIME OF OCCURRENCE,	72

	PAGE
DURATION,	76
SYMPTOMS,	78
COMPLICATIONS AND SEQUELÆ,	84
PATHOLOGY,	87
DIAGNOSIS,	94
PROGNOSIS,	98
TREATMENT,	102
General,	102
Local,	107
Prophylactic, Hygienic, and Systemic,	116
BIBLIOGRAPHY,	127
INDEX,	147

HAY-FEVER.

Synonyms.—Autumnal catarrh, Bostock's catarrh, coryza vasomotoria, coryza vasomotoria periodica, hay-asthma, idiosyncratic coryza, June cold, July cold, nervous coryza, nervous catarrh, paroxysmal sneezing, peach cold, periodic hyperesthetic rhinitis, pollen catarrh, pollen poisoning, pruritic catarrh, pruritic rhinitis, ragweed fever, rhinitis sympathetica, rhinitis vasomotoria, rose catarrh, rose cold, summer bronchitis, summer catarrh, summer catarrh from idiosyncrasy, summer fever, typical early summer catarrh, vasomotor coryza, vasomotor rhinitis.

Latin eq.—Catarrhus æstivus, coryza vasomotoria periodica.

French eq.—Catarrhe d'été, catarrhe de foin.

German eq.—Frühsommerkatarrh, Heuasthma, Heufieber.

Italian eq.—Asma dei mietitori, febbre del fieno, asma del fieno.

Definition.—The term “hay-fever” was first used to designate the form of disease occurring in the autumn in distinction from like affections which occur in other seasons. So universal, however, has become its use that it is now employed to designate all the forms of what may be called the periodic influenzas, irrespective of seasons.

Hay-fever may be defined as an affection of the upper air-passages occurring periodically, usually at or near a fixed date in the early autumn, sometimes in the spring or summer, characterized by its sudden onset and as sudden termination in certain atmospheric conditions, by swelling and turgescence of mucous membranes of the nasal fossæ and adjacent cavities, irritating discharges therefrom, and various symptoms of coryza, and occasionally by asthmatic paroxysms. It always results from the combination of a special predisposition, from depraved resistance or lowered vitality of the general system or a local lesion, and an exciting cause, believed to be a micro-organism or peculiar toxin, generally arising from pollen or dust deposited upon or in the mucous membrane of the upper air-passages. The important predisposing causes are:

heredity, idiosyncrasy, neurotic temperament, peculiar susceptibility of the vasomotor system, generally debilitated condition, deranged assimilation, and a local lesion. Hay-fever has been defined as a neurosis, as an idiosyncrasy, as a catarrhal affection, and as a type of influenza, and as various combinations of these. The deposition of some special irritant is universally regarded as the exciting cause.

GENERAL REMARKS.

The idea of an external irritant in hay-fever pervades most views of it. There can be no doubt, however, that there is usually an **underlying systemic condition** which renders individuals susceptible to the disease. It may, in addition, be accepted as conclusive that the **nasal abnormalities** found in hay-fever subjects are as often incidental as causative. They are seldom exclusively provocative of the susceptibility, and they are not the results of repeated attacks. Exactly what this underlying condition of susceptibility is has been variously regarded. The nature of the irritant has been widely and scientifically investigated. While all theories advanced are in part more or less tenable, none of them alone is satisfactory. The condition is always, however, one of lowered resistance, general or local. If general, it may be of neurotic, lithemic, idiosyncratic, gastric, intestinal, or diathetic origin. It is, therefore, my belief, that in hay-fever there is always, first, an exciting agent, and, second, a system predisposed by debility of some character

to the influence of this irritant. The overwhelming testimony as to the character of this irritant points to its derivation from something external to the body of the sufferer. Moreover, it is absolutely certain that without the action of an external irritant genuine hay-fever does not occur. The elaborate and ingenious experiments of Blackley, not only upon himself but upon other individuals, clearly indicated the pollen of flowering plants as an active, exciting cause. It has never been shown that, although pollen, healthy or unhealthy, may be a mechanical irritant and thus account for many cases, it is not also a chemic irritant when it has fallen upon a susceptible soil. It has been claimed that hay-fever is caused by a toxin generated by a fermentative process in the pollen which has fallen into the alkaline solution of the nose; and it has been shown that acid solutions stop the movements of many micro-organisms and spermatozoa, and that alkaline solutions in the nares have given little or no benefit in attacks of hay-fever. It has also been shown that the affection is more common among men than among women, and that the blood of the latter is the less alkaline.

Arnold, in 1896, stated that just what constitutes

the irritant is not determined, and said it is likely that not healthy pollen but some fungoid growth is responsible, since threshers of grain, at other times without ill-effects, have complained of attacks of hay-fever after threshing smutty or moldy grain, especially oats.

Helmholtz, himself a sufferer from hay-fever, discovered peculiar **micro-organisms** in his nasal discharges. These vibrios were never found by others, and this fact is supposed to controvert his theory. It has not been shown conclusively that they have been sought for by other investigators, and it is likely that they have not, since attention has been called away by the pollen and other theories. The antiseptic quinin solution employed by Helmholtz, while extensively used with good results for the subsequent decad, was not invariably accompanied by relief. Later, the relief that was given by quinin solutions was said to be psychic. This allegation may well be understood when it is considered that many other theories as to the causation of hay-fever, particularly the pollen, abounded soon after Helmholtz's expositions.

Some very interesting investigations by Strangways, of St. Louis, in 1897, urged him to conclude

that the amount of pollen in the air is altogether too small to have an injurious mechanical, medicinal, or poisonous influence. He calculates that for every square foot of surface there is one ragweed, and inquiry showed that mere elevation of several hundred feet above the earth's surface does not give relief from this distressing affection. Strangways found that ragweed pollen probably floats to 1000 feet elevation; but, if the limit is placed at 500 feet, it would give for every plant 500,000 cubic feet of air, not for one day but for six weeks; *i. e.*, if the whole plant was pollen there would be still only one part of pollen to fifteen or twenty billion parts of air. The rose and the golden-rod are in even smaller quantities. Strangways' estimates showed that there was not more than one grain of pollen for every thirty respirations. He advanced the theory that, while pollen plays a part, it does not irritate mucous membrane nor produce vasomotor paresis by its direct influence, but that a **protoplasmic substance** found in pollen and in the vegetable kingdom, acting as a ferment, causes the formation of a toxin which is the real exciting cause.

There can be little doubt that the **neurotic ele-**

ment has been present in many, if not most, cases of hay-fever, and evidenced by depression, general lowering of tone, or exhaustion of the nervous system. The neurosis need not be acquired; in fact, it is often hereditary, which will be discussed later.

Holmes believes the disease to be in great part a neurosis with other debilitating conditions. The fact that the better educated classes are most prone to this affection indicates the influence of neurotic tendency as well as exhaustion of the nervous system or debility or depression thereof. The premonitory symptoms of this affection, as ably shown by Sajous, show the neurotic elements. He well asks, "If the local irritant is the only cause, why does the respiratory tract, the portion of the body first and most exposed to its effects, not become immediately influenced?" This author also shows a case following enteric fever, the debilitating and exhaustive character of which is well known, one preceded by malarial fever and another by bronchitis, pertussis, and varicella.

Of the various other theories advanced are the lithemic, the intestinal or gastric, due to lack of proper assimilation, and the uric acid diathesis.

The views herein advanced are not at all inconsistent with the idea that the diatheses exercise a predisposing influence in producing the affection, which influence is debilitating and devitalizing.

The **local theory** alone is not conclusive nor satisfactory; viz., that the disease is due to chronic nasal catarrh, or a local lesion, upon which the exciting cause acts. There is no doubt that diseased areas are more sensitive to the irritant, and especially so in cases of lowered vital energy and lessened normal resistance, general or local; but a large number of cases show no local disease.

In all of the theories respecting this affection there is more or less regard for the agency of pollen in provoking the paroxysms of the disease; but as every one is exposed to the irritant, in those affected the soil must be prepared for the seed, that is, before the deposition of the pollen or dust or exciting agent there must be a morbid condition preëxisting, which can so far be characterized as to call it lowered vitality or general or local resistance, which springs from a variety of causes.

HISTORY.

Exactly when hay-fever was recognized as a distinct affection is not known. Beschorner shows that it was known in the sixteenth century. In 1565 Botallus reported a case. Van Helmont and Binninger in the seventeenth century speak of it. A similar distressing catarrhal affection, but due to the rose, is instanced in "Acta nat. curios. Ephemerides," Dec. II, Ann. V, obs. 22, and again in the same journal, Dec. III, Ann. V and VI, obs. 193, a case of annually recurring profuse nasal catarrh is mentioned. John Floyer, London, 1698, noticed that there were peculiar cases of asthma in which the attacks were longer and more acute in summer than in winter. In Good's "Study of Medicine" there is a reference to a case related by Timæus in 1667, of an attack of an asthmatic nature caused by the odor of roses and ipecac. Riedlin, in his "Lin. Med.," p. 177, in 1695, wrote of the odor of roses causing a catarrh of the head, resembling hay-fever. C. L. Parry, of London, records a case in 1809 and another in 1811. Elliotson, in 1821,

tells of a patient who had had hay-fever since 1789, and of another who was sixty-six years of age and who had had the disease from his seventh year, *i. e.*, since 1755, and of a third who had been afflicted for many years.

Just when and where the term "hay-fever" or "hay-asthma" arose it is impossible to say, but probably it was popularly so named. The emanations from dry hay were first thought to have caused it. Dr. Bostock, who was himself a sufferer, in 1819, found that the laity knew of the affection, although it was not recognized as a distinct disease by the profession. He objected to the term "hay-fever," which was already employed to designate it in his day, contending that moist heat, sunshine, dust, and fatigue were more potent in its causation than emanations from dry hay. It seems remarkable that the profession in England were unfamiliar with hay-fever as a distinct affliction, especially as their king, George IV, was a sufferer from it. In 1828 Bostock, who had first described the disease to the Medico-Chirurgical Society of London as a "case of a periodic affection of the eyes and chest," published some further observations on the complaint

under the title "Summer Catarrh," or "Catarrhus Æstivus." In 1828 MacCulloch included it in his "An Essay on the Remittent and Intermittent Diseases," but advanced no special views. In 1830 Augustus Prater published notes of a case seen in Paris. In 1831 Dr. Elliotson, in London, briefly described the affection; and in 1833 he discussed the complaint more fully and opposed Bostock's theory of heat and rejected the hay-theory of its origin, but declared grasses to be more important factors; and he first pointed to pollen as the probable cause of the disease. In 1847 Dr. Ramadge detailed reports of cases and believed "effluvia from flowers" caused it. In 1850 Gream first alluded to dust as an exciting cause and proposed nux vomica as a remedy. In 1852 Dr. Laforgue, of Toulouse, wrote his essay "Observation de catarrhe d'été," in which he upheld heat as the cause, after the view of Bostock. But in the next year, 1853, in "L'Abeille Médicale," an anonymous contributor, reciting his own case, advocated hay-emanations and not heat as the exciting agent. In 1854 Phœbus, of Giessen, concluded from his study of 154 cases that sunlight was the active cause of the attacks. In

1857 Watson ascribed the malady to the presence of vegetable matter in the atmosphere. In 1859 Phœbus again published the results of his circular of inquiry. He went into the subject more thoroughly than any of his predecessors, and from sunlight he shifted to ozone as the theoretic cause of the malady. In this same year Hyde Salter named as the exciting agents "bright, hot, dusty sunshine," a full meal, and hay, and recited two interesting cases. Another writer, Walshe, in the same year, referred to hay-fever as a singular variety of nasopulmonary catarrh, and he first called attention to the fact that the disease, in his own person, "always disappeared in crossing the Atlantic."

In July, 1860, Dr. Cornaz, of Neufchâtel, Switzerland, in a paper on hay-fever, described six cases, and concluded that the flowers of grasses were the cause of the disease, and he was followed on the 20th of August of the same year by Dr. Labosse, of Nîtry, France, in a paper entitled "Nouvelle Observation de Catarrh de Foin," in which he spoke of three persons whose symptoms occurred at the time certain flowers were in bloom. In 1866 strong light and great heat were ad-

vanced as aggravating causes by Dr. Wm. Abbotts Smith. In his published work, "On Hay-fever, Hay-asthma, or Summer Catarrh," he rejected the ozone theory of Phœbus.

In 1867 the **nervous origin** of the disease was first advanced by Dr. William Pirrie, who spoke of two forms,—one a spasmodic form caused by external irritants, the other arising from the action of light and heat upon the central nervous, the cerebrospinal, and sympathetic systems. In the same year, Helmholtz, who, though not a general practitioner, while suffering from hay-fever, began to treat it with a quinin solution and found that he was relieved thereby. Two years later he detailed to C. Binz, of Bonn, Germany, by letter, the history of his sufferings, and recommending his solution as a ready means of relief and even of prevention, which was in accord with the findings of Binz that the quinin solution was poisonous to infusoria. In this letter Helmholtz propounded the theory that the symptoms were caused by **vibrios** which, though latent at other times in the nasal fossæ and sinuses, were excited to activity by the heat of summer. It has since been thought that the organisms found by Helmholtz, by means

of the microscope, in the nasal discharges during an attack were probably fragments of mycelium-like threads which develop from pollen-cells under the influence of the heat and moisture of the nasal chambers and which contain the minute fovilla of the pollen-cells. The use of the quinin solution which Helmholtz so successfully employed on himself became very popular and found many strong advocates in the profession until the extensive researches of Blackley in regard to pollen in 1873. In the meantime, in 1870, Dr. George Moore advocated a complex theory of the disease, really combinations of preceding theories. In the same year Roberts issued a short, practical paper, claiming to be the first to observe excessive coldness of the tip of the nose as the "pathognomonic" symptom of hay-fever and desiring credit to be accorded him for this discovery.

In 1872 Morrill Wyman, of Cambridge, Mass., distinguished two different forms of the disease; naming that occurring in August "autumnal catarrh," peculiar to America, and that of the spring or early summer "June cold" or "rose cold," more prevalent in England.

Dr. Wyman first attempted to define the geo-

graphical limits of the disease, and called attention to the important fact that residence in certain elevated regions brought certain and complete relief in most cases of autumnal catarrh. He stated that a lady from Lynn, Mass., a great sufferer, accidentally observed in 1853 that her catarrh passed by while she was traveling in the White Mountains, and that for the following ten years she visited the region and escaped the disease. In 1860 Jacob Horton, of Newburyport, Mass., wrote Dr. Wyman that the White Mountains gave the only relief. In 1873 Charles H. Blackley, of Manchester, endeavored to show that pollen mainly, if not exclusively, caused the malady, and by extensive experiments showed that the amount of pollen in the atmosphere at great elevations was to that in the air at ordinary breathing levels as nineteen to one. He proved, by very ingenious and carefully conducted series of experiments, that the pollen of grasses and flowers was the sole cause of hay-fever in himself, and that in two other patients the severity of the attacks was directly related to the amount of pollen in the air. His subsequent observations made it extremely probable that pollen is an important factor in the

causation of hay-fever, although all kinds of dust may be sufficiently irritating to excite the paroxysms. This was in opposition to the views of Phœbus and of Pirrie, both of whom suggested heat, strong light, and ozone as the exciting causes. Pirrie had also suggested disturbance of the **central nervous system** as an important etiologic factor. He was supported in this view in 1876 by Morrill Wyman, then of New York. In the same year Beard, of New York, published his monograph, the information for which had been painstakingly gathered from replies to two hundred circulars which he had issued to medical men all over America, somewhat after the manner of Phœbus; although, unlike Phœbus, Beard had himself seen and treated many cases. From his data he drew the conclusion that the immediate exciting causes were more than thirty in number, and that secondary causes might increase this list to more than one hundred. He also showed from his statistics that the nervous temperament existed in a great proportion of the sufferers, and that nerve tonics were of some value. In 1877 Marsh, of Tuckerton, New Jersey, published an essay in which he accepted completely the pollen theory.

He first called attention, in this paper, to the activity of the pollen of *Ambrosia artemisiæfolia*, or common ragweed, as by far the most active of the pollens in America in producing the attacks.

In 1882 Daly, of Pittsburg, first called attention to the fact that a **diseased condition of the nasal cavities** was an important factor in the production of the exacerbations of the disease. Roe, of Rochester, in 1883, advocated the same theory, but added that "removal of the diseased tissue removes susceptibility to future attacks." In the same year, Sajous' essay appeared in which he advanced idiosyncrasy as a heretofore unconsidered element in the cause of hay-fever, and laid stress upon the three essential factors in the production of an attack; viz., first, an external irritant, second, a predisposition of the system, and, third, a vulnerable or sensitive area. In 1883 Hack accepted the local theory of the causation of the disease. In 1884 Harrison Allen, of Philadelphia, attributed the affection to a permanent or temporary **obstruction of one or both nasal chambers**. In this year, J. N. Mackenzie, of Baltimore, termed the disease "coryza vasomotoria periodica," be-

cause it is essentially a *coryza*. He says: "The well-recognized, but imperfectly understood personal susceptibility to certain forms of local irritation, which is the sad prerogative of sufferers from this disease, has always been the stumbling block in its investigation and the rock upon which the various speculations as to its nature have been wrecked." He demonstrated that "there exists in the nose a well-defined sensitive area whose stimulation through a pathologic process or through *ab extra* irritation is capable of producing an excitation which finds its expression in a reflex act or in a series of reflected phenomena." He thus claimed functional derangement of nerve centers as essential to the disease. It was also in 1884 that Sir Morell Mackenzie asserted that the universal cause of the disease was pollen, although he did not deny that other irritating particles, *e. g.*, ipecac, if persistently brought in contact with the mucous membrane of the nasal chambers, may produce it.

In 1885 Seth S. Bishop advocated the uric acid theory of the origin of the disease.

In 1887 Sir Andrew Clark, in the Cavendish Lecture in London, emphasized the doctrine of

the **three great causative factors**,—viz., first an exciting agent, generally pollen; second, the neurotic habit; and, third, a local morbid condition of the nasal mucous membrane.

Since then many articles have appeared upon the subject, but no striking innovations in the possible etiology of hay-fever have been offered.

In 1893 Macdonald said, we ought not to describe hay-fever as a disease but merely as a train of symptoms—a train of physiologic reflexes instigated by an unwarrantably small provocation in certain individuals more susceptible to the influence thereof than the rest of their kind.

Early in 1897 Grayson, of Philadelphia, stated that “the neurotic habit may exist but is not essential to the disease, and the nervous system is implicated as a victim, not as a culprit.” He claimed that hay-fever is a defect, not of the nervous, but of the **nutritive system**, believing that the digestive tract is the cradle of the systemic error.

In October, 1897, Edmund W. Holmes, of Philadelphia, stated his belief to be that hay-fever was largely a neurosis, originating in local disease of the nasopharynx, the characteristic manifesta-

tions being in part direct, the result of central nervous modifications, and in part reflex, from the action of various mechanical irritants, aided by local and constitutional factors when they exist, and by seasonable and climatic influences, the periodic and peripheric susceptibility being in particular expressions of certain impressions.

EXCITING CAUSES.

It being generally recognized that there are two elements entering into the causation of hay-fever, viz., an exciting agent and a predisposing or preëxisting condition, regard will be given the subject of causation from this standpoint.

A great number of agencies have been regarded as the direct causes of this disease, but opinion in the main has assigned pollen as the essential factor, acting upon the preëxisting condition or predisposition. It may be better, however, to give a résumé of other agencies before regarding this subject of pollen. The most important of these are heat, light, dust, ozone, overexertion, ipecac, lycopodium, coumarin, benzoic acid, chocolate, or several of these in combination.

Heat.—No attempt to signify or designate a definite cause was made by the early writers until 1819, when Bostock first described the malady and ventured the view that it was due to the influence of solar heat. He attributed his own

prolonged sufferings to the exposure to the sun's rays and fatigue.

Some time after, Phœbus attributed the affection to "the first heat of summer," which, he stated, "is a stronger cause than all the grass emanations put together." Phœbus subsequently modified his views so as to regard the first heat of summer as acting only in an indirect manner as an exciting cause, and admitted that hay and the blossoms of rye caused exacerbations. It can not be contended, at this day, that heat alone will provoke the disease. In the plains of India when the heat is greatest it is not found, although later in the year, in the cooler months and before vegetation is burned up, it does appear; but among the hills of India where the climate is milder and the grasses and cereals are in blossom hay-fever exists. At sea, when vessels are becalmed and heat is most intense, and in the great heat of the desert hay-fever is not found. Pirrie shows that great heat is common to all cases, even when the vegetable world is looked to for the cause, and strangely points out that the premonitory feelings of an attack coincide with those caused by high temperature. One of the most interesting cases

from this standpoint is that of an Englishman, who, although not a medical man, is well known to science—Richard Proctor. The asthma—for it took this form—occurred only during the cold months, and was always aggravated by a rime or hoar-frost, especially if the latter was followed by a bright, sunny day.

It is a striking fact that in regions comparatively free from the disease persons subject to it become worse on warm days, or when the wind blows from the South. It has been found by experience that while this aggravation by winds is in most part due to the presence of more pollen, the higher temperature is also in a measure responsible. Hot, dry days are more favorable to the dissemination of pollen than rainy ones, and it becomes especially active when hot, dry periods follow stormy weather. In the light of Blackley's experiments upon the amount of pollen in the atmosphere, these facts would seem to explain the action of heat and sunlight as an active cause in the production of the exacerbations of hay-fever.

Light.—Phœbus was dissatisfied with the view of the influence of solar heat, and thought that the longer days, which produce a more continuous

action of light, were perhaps to blame; but where light is strongest and lasts the longest—indeed, in the land of the “midnight sun”—hay-fever is practically unknown. Pirrie called attention to the fact that exposure to strong light aggravated the symptoms of the attack. The foregoing case of Richard Proctor is an instance of the truth of this. There is an instance of the widow of a clergyman whose attacks, most severe in summer, were aroused by sunlight in the early morning. Ingals knew a clergyman who was unable to cross the street on a hot day without sneezing violently unless he carried an umbrella. Persons with sensitive mucous membranes, especially subjects of hay-fever, are, no doubt, sometimes liable to attacks of sneezing from sunlight; but these symptoms must not be mistaken for true hay-fever. Ingals states that he knew an individual in whom attacks of sneezing were brought on by exposure to bright gaslight. Gaslight was also regarded by Beard as a cause of this affection. However, Morell Mackenzie shows that gaslight is employed more in winter when the affection does not prevail than in the English spring and American autumn, when the affection most prevails. Nothing can

exceed the reflected glare of sunlight at sea on a bright day, yet it is upon the sea that exemption from attacks of hay-fever is universally found.

Dust.—From his scientific investigations upon the subject, Beard, whose published work is a model, concluded that it was extremely probable that dust occasionally caused hay-fever. Out of 198 cases of hay-fever reported by him no less than 104 attributed the affection to dust. One hundred and forty-two of these cases, however, occurred between May and September, the usual hay-fever season; and the lay, not the trained professional, mind advanced the causes. Some attributed the affection to “indoor dust”; some to “cinders.” These data of Beard, therefore, must be taken *cum grano salis*. More especially is this so since a paroxysm of sneezing and subsequent coryza, frequently brought on in normal health by the mechanical irritation of dust or even strong odors, should hardly be dignified as an attack of hay-fever. In England, in February, March, and April, when strong east winds often blow clouds of dust against the face, the symptoms of hay-fever do not appear, whereas in June and July,

when dust is comparatively little, the affliction is most extant.

Holmes stated that even in winter-time stirring among old books or in an old garret the exposure to the fine dust therefrom would, by simple mechanical irritation, produce an attack in him. It has been the consideration that dust, or pollen acting as any other form of dust, could be kept from entering the nasal chambers that has given rise to the various inventions to purify the air before it enters the nose, such as plugs of cotton or wool, and veils (which, in addition, soften the glare of the sun and lessen the irritating action of winds upon the face). Every hay-fever sufferer knows the little value of such device.

Ozone, Benzoic Acid, etc.—From the vast quantity of facts and observations gathered together by him, Phœbus, who previously had ascribed sunlight as the cause of hay-fever, endeavored to extract a complete theory of the disease. He suggested an excess of ozone in the atmosphere as a possible cause. It remained, however, for Blackley, in 1873, by his great endeavors and scientific methods of investigation, to disclose the fallacy of this theory. He pur-

posely breathed air highly charged with ozone for five or six hours without effect; and without inconvenience he inhaled ozone artificially prepared and in quantities far exceeding that found in the same volume of atmospheric air. This same physician also studied upon himself the effects of benzoic acid, a substance shown by Vogel to be contained in *Anthoxanthum odoratum* and *Holcus odoratus*, the two species of flowering grasses to which the causation of hay-fever has been attributed. Likewise he investigated the odorous principle of many flowering grasses, coumarin, and the volatile oils which impart to many plants, such as peppermint, juniper, rosemary, and lavender, their characteristic perfume. In all these cases the results were negative.

Various Other Exciting Causes.—These are in numberless variety and many of purely idiosyncratic nature. Emanations from dry hay, sunlight, gaslight, heat, minute organisms as supposed by Helmholtz, the “mange” insect, dusts of all kinds, bad air, railway smoke, brimstone matches, flowers and fruits, odors from dogs, cats, horses, cattle, rabbits, guinea-pigs, and wild animals, have all been held responsible for the paroxysms.

Ward Smith records linseed meal and mustard as exciting causes. Wm. Murrell mentions powdered **May-apple** (podophyllum), the effluvia of clean pocket handkerchiefs fresh from an ironing table, locust-tree blossoms, mulberry blossoms, and fruit. The exhalations from feathers have been regarded as causes. It is well-known that various drugs like ipecacuanha and lycopodium give rise to attacks, and sulphur has been mentioned as a cause. Sir Thomas Watson names a servant in St. Bartholomew's Hospital affected by ipecac. Cullen tells of an apothecary's wife who, whenever ipecac was triturated in the shop, had an attack of hay-fever. He also mentions the vicinity of a rice-threshing floor as a provocative cause. Itzigson tells of a merchant who had hay-fever paroxysms whenever fresh coffee was handled in his presence; and it is recorded of a dyer that he could not work when the wood of the oak (*Quercus tinctoria*) was lying about. The author knows of a case in a physician in whom violent paroxysms of sneezing are induced by the tasting of chocolate. It is related in the "Twentieth Century Practice of Medicine" that a hay-fever patient fond of tomatoes and watermelons was unable to eat

of them during the usual hay-fever season without most violent disturbance of the gastro-intestinal tract. Bastian was subject to attacks of an affection like hay-fever while dissecting the *Ascaris megalcephala*, a parasite infecting the horse. Hyde Salter tells of a clergyman affected by the vicinity to a dead hare, and who was thus able to detect the presence of a poacher. H. Charlton Bastian had like effects from the "mange" insect of the horse. Ringer and Murrell tell of a young gentleman made worse by the vicinity of horses or stable people. Once, while in the theater, an attack suddenly supervened without any appreciable reason until a horse galloped upon the stage. Macdonald, in 1893, mentioned a patient who, two or three hours after having patted his horse with his gloved hand, inadvertently put it to his face, and was immediately seized with a violent paroxysm. The odor from the inner aspects of the legs of the horse was very irritating to one writer a "sufferer." Ringer and Murrell cite the case of a gentleman who, subsequent to an acute pleurisy, was ever after a subject of "hair-caterpillar asthma," and was immediately attacked if by any chance he touched a caterpillar.

The difficulty of sometimes finding some exciting agent is shown by the case of Drenger. After searching several years in vain for the cause of attacks of hay-fever caused by entry into a certain room in a house, and after ransacking nearly everything in the house, a **mattress** was suspected, and, upon removal, was satisfactorily shown to be the offending agent.

The odor of **peaches**, of **violets**, of the **mignonette**, of **chocolate**, of **musk**, and of **peppermint**, has come in for a share of the blame. Trosseau relates of himself that attacks came on when he entered a room in which there were violets. The botanist Broussais was often impeded in his work by attacks caused apparently by the odor of a rose. Hünerswolff and Morell Mackenzie each cite a case in which the perfume of the rose produced attacks of coryza. The former's account is in the "Ephemerides," and has been often referred to. The latter's case proved rebellious to treatment, and the sufferer had, at last, to banish these flowers from her garden. That this peculiar antipathy to flowers is often imaginative is shown by John N. Mackenzie, who cites the case of a subject of hay-fever to

whom he handed an artificial rose. Immediately an attack of rose-cold ensued. A patient mentioned by Morell Mackenzie, while gazing upon a picture of a hay field, was seized with an attack of hay-fever. These last two instances indicate the psychic influence rather than any extraneous cause, but they serve to show the varieties of exciting agents.

The Pollen Theory.—The external cause which has been by far the most generally recognized and accepted as the most frequent is pollen. The older writers upon this theory did not distinguish the underlying condition necessary before pollen could act as a cause of the disease. The remarkable and elaborate **experiments of Blackley**, from 1866 to 1878, conclusively prove that a most important exciting cause of hay-fever is found in the action of pollen upon the mucous membrane of the nasal cavities. In his own person he showed that the inhalation of pollen always brought on the symptoms of hay-fever; that there was a direct relation between the intensity of the symptoms and the amount of pollen in the air, and that none of the other agents referred to, such as heat, light, ozone, dust, or odors,

would, of themselves, cause the distress. His range of observation included the pollens of various grasses and of cereals and of plants of thirty-five other natural orders. His experiments were made in the hay-fever season in England, between the end of May and the latter part of July, and showed that ninety-five per cent. of the pollen contained in the atmosphere belonged to the *Graminaceæ*. The apparatus from which he obtained the most satisfactory results in his investigations consisted of a vertical plate of glass, $\frac{7}{8}$ of an inch in diameter. It was covered with a hood, and was pivoted to an upright staff. A weather-vane surmounted the hood to control the face of the glass-plate before the wind. Upon this glass-plate was affixed a microscope cover-glass, one cm. in diameter, covered with glycerin. Any pollen floating in the atmosphere would thus be carried upon the plate by the wind-current and adhere to the glycerin upon the glass-slide. Blackley thus found that the amount of pollen caught upon the plate increased progressively from the seventh to the thirtieth of May, when twenty-five grains were counted, to seventy-six grains on the eighth of June, and to 280 grains on

the tenth of June. On the twenty-eighth of June 880 grains were counted, after which date they decreased until the first of August, when they had completely disappeared. Bright, sunny days brought large quantities of pollen, while rainy days decreased the amount. Passing showers ameliorated the individual symptoms, though not affecting the amount of pollen deposited upon the slide. Blackley also clearly showed that the mucous membranes of the nasal fossæ were not affected by pollen in the atmosphere when twenty-five grains per diem only were deposited on his glass, while seventy-five grains in twenty-four hours would irritate in certain individuals. When 280 grains of pollen per day were deposited the direct action upon the mucous membrane of this quantity would result in complete vascular dilatation.

Clinical observation has shown a parallel, but by no means a complete, analogy to the above phenomena in the action of cocain in different strengths of solution.

Emanations from the rose and from rye have been shown to have caused coryza, occlusion of the nostrils, and sneezing for from six to eight

hours. The sweet-scented vernal grass (*Anthoxanthum odoratum*), sweet-scented soft grass (*Holcus odoratus*), meadow grass, meadow fox-tail, Indian corn, barley, wheat, oats, bean-flowers, lilies, elder trees in bloom, the golden-rod, hay, timothy, and clover, and others may be mentioned. In America the pollen of the **Roman wormwood**, rag-weed, or **hog-weed** (*Ambrosia artemisiæfolia*), is the most commonly referred to. It is very common in nearly all the States. It blossoms in August and September, the prevalent time of hay-fever. Wyman and his son, who had fled to the White Mountains to avoid hay-fever, were immediately attacked when a package of the rag-weed was opened there. The seashore, usually exempt, sometimes is not so, probably due to the presence there of the pollen of the *Artemisia gallica*, another kind of wormwood. In England the *Anthoxanthum odoratum*, or "sweet-scented vernal grass," seems especially causative. There must also be mentioned the common daisy (*Bellis perennis*) of England; also the rye-grass (*Lolium perenne*) and "sweet-scented soft grass" (*Holcus odoratus*). In Germany the rye-blossom is chiefly indicated as a cause. In Australia the Cape Weed pollen is

regarded as most commonly provocative. It covers the hills round about Adelaide to the height of some thousand feet or so. Most of the population of Adelaide are affected with hay-fever during the time of its blossoming, viz., in September. In India, where the malady occurs chiefly in February, it is the blossoms of the mango-tree (*Mangifera indica*) that are held responsible.

J. C. Wilson holds that most subjects are not sensitive to emanations from hay, and points out that there are no distinctive bacteria to give rise to the affection. Marsh, himself a sufferer, stated his belief in the pollen theory, conceiving hay-fever analogous to *Rhus toxicodendron*, or ivy-poisoning of the skin.

There are two authentic cases which would impair the pollen theory, the well-known exemption of hay-fever subjects at sea being granted. One is mentioned by Walshe, in which a passenger retained his symptoms of hay-fever during a passage across the Atlantic. Abbots Smith has reported the other, in which the disease came on at sea nine miles from land. In this latter case, unfurling the sails in which a large quantity of pollen had been folded may explain the occur-

rence. In the former instance the diagnosis was by no means certain and the presence of some other irritant may have accounted for the distress. Moreover, it is by no means impossible for pollen to be deposited on a ship even when miles away from land. In speaking of the distribution of pollen Darwin tells of how the ground near St. Louis, in Missouri, has been so widely covered with pollen that it looked as if it had been sprinkled with sulphur. Pine forests, 400 miles south, were probably the place and distance from which it came. On March 16, 1883, in Philadelphia, ignorant people took for brimstone a shower of yellow pollen which had been blown from some distant pine forest.

After citing many of the various causative pollens Holmes says that he is "not aware that any specialized action has been proved; all act (if at all) by mechanical irritation." He also shows the punctuality of flowering on the self-same date yearly is an absurdity, depending, as the flowers do, upon the variations of the seasons. The date of the flowering of plants varies within certain limits, and he points out the mutability of the blossoming date, or, more rationally, its limited

variation, and further adds that "even as a mere irritant, as pollen affects comparatively few, it must act upon a condition which is preëxistent, which is, therefore, independent of and predominates it, else would the cause, pollen, produce it universally."

As already mentioned, it has been claimed that a **toxin** generated from pollen by a fermentative process in an alkaline solution is the cause of hay-fever.

PREDISPOSING CAUSES.

While millions of people are exposed to the exciting causes of hay-fever, comparatively few suffer from it, and that there is an underlying condition, predisposition, or idiosyncrasy, can hardly be doubted. Exactly what this is, or on what it depends, is unknown. Abbotts Smith as early as 1865 spoke of a predisposition to attacks of hay-fever as one of the principal causes thereof. As Holmes has shown, there must be individual predisposition, since the exciting causes, if pollens, are everywhere. This predisposition or idiosyncrasy has generally suddenly developed without apparent reason. It has been argued that it is systematic or central, and that it is due to some local abnormality of the mucous membrane, the capillaries, or the periphery of nerves. Once acquired, however, it is seldom lost, and it apparently increases with each successive year.

Race.—The influence of race is seen in the fact that the English-speaking people are the principal sufferers. In India, Africa, and Australia it is mostly the English and Americans who are

attacked. In America it occurs in nearly every State, although much more infrequently in the South. In Canada hay-fever is rare, especially in the maritime provinces. Wyman relates a case—the only one reported—of hay-fever in an Indian child. Beard mentions that Dr. Jacobi, of New York, who practised much among the Germans, had never met with a case in that nationality; and in the same city a similar observation was recorded by Dr. Chaveau, a practitioner among the French. Sajous has called attention to a curious fact in this connection—viz., that the principal sufferers, American and English, are the only great tea-drinking nations, and that this beverage may exert a depressing influence on nerve centers. It would be interesting to have some information as to the existence of hay-fever in China and Japan, the tea-producing countries. John N. Mackenzie, in 1884, gives the first recorded instance of hay-fever in a negro, a male of thirty-five, tall, well-proportioned, and respectable, the attack lasting from the second week in August to late in September. A sensitive spot was found on the left inferior turbinated bone, $1\frac{1}{4}$ inches within the

nostril, which gave origin to a most intense paroxysm of asthma on simple contact with the probe.

Geographic Distribution.—Reports of hay-fever have come from nearly every quarter of the civilized globe. It is seldom seen in the far North, and is more frequent in the temperate than in the torrid zone. It is seen more often in urban than in rural districts. The disease is by far the most frequent in Great Britain and the United States. In Norway, Sweden, and Denmark it is seldom found, and it is scarcely ever seen among the natives of Russia, Germany, France, Italy, or Spain. The English and Americans in India and Africa are the only ones who are affected by it. Macdonald, in 1893, said the Irish are certainly not exempt. In the north of Scotland it is very infrequent, while in the south of England the disease is more frequently found than in the north. In Australia and New Zealand it is occasionally found. Literature is strangely silent about South America, but this land is strange to us in many other ways. Pirrie gives an instance of an English officer in India suffering there when vegetation was altogether different from the forms met with in Eng-

land where his attacks had begun. The complaint has made its appearance in two instances when its victims were at sea; one, reported by Abbotts Smith, after shaking out the sails when nine miles out at sea; and another, reported by Walshe, in which the patient suffered throughout a voyage across the Atlantic. A "sufferer" records that numerous portions of England, especially the highlands and the sea-coast, and nearly all of Wales and Scotland are exempt from the disease. He also regards the upper side of the St. Lawrence River, most of the province of Ontario north of the Welland Canal to the Detroit River similarly exempt, and he states that the disease is wholly unknown to regions above the outlet to Lake Huron.

Wyman has considered the regions of America where hay-fever is especially prevalent. That portion of the country east of the Mississippi River and lying between the 35th and 45th parallels of latitude he regarded as the territory of prevalence. Canada and the Adirondack Mountains, the Appalachian range, and the elevated plateau throughout New York State he considered almost exempt from hay-fever. That

portion of the United States west of the Mississippi River he seemed to think, as did Beard also in his later investigations, was free from the disease. Beard based his reasons upon the lack of vegetation and the sparseness of the population. Bosworth regards as better reasons the rugged mode of life of the inhabitants and the consequent vigorous health of the frontier life. It is a curious observation, too, that certain portions of the White Mountains country, formerly regarded as invariably free from hay-fever, of late years, probably owing to the extension of civilization and its vegetation to these regions, are no longer exempt from it. Southern climates, to a certain extent, are exempt from the disease. Wyman thought it did not prevail south of the 35th parallel of latitude, with the exception of certain districts in the neighborhood of Milledgeville, Georgia, Montgomery, Alabama, and Beaufort, North Carolina. There can be little doubt that the affection is less common in Maryland Virginia, in the border States, and in the far West; that it is rare in the extreme South and on the Pacific slope. The zone between the 35th and 45th parallels of latitude practically includes the

hay-fever district. Even in this section, localities, from their proximities to large bodies of water or to oceans, to elevation or to absence of certain vegetation, afford immunity. A "sufferer" states that on Lake Michigan hay-fever is absent above Ludington, while on the Mississippi, in Wisconsin, it is present as far north as the Chippewa River, and in some seasons, in a mild form, it is seen in St. Paul, Minnesota. It is known to extend to the latitude of Memphis in the West, Knoxville centrally, and Cape Henry on the Atlantic. In 1896 W. W. Bulette stated, that in certain sections of Colorado there is a variety of the affection known among laymen as blossom or **cotton-wood fever**, and very prevalent in regions where the cotton-wood tree abounds. The symptoms are practically identical with those of the autumnal variety of hay-fever, except that the throat and bronchial irritations are intensified, and the course of the attack is somewhat shorter. Symptoms occur about the twelfth of April and terminate in the latter part of May, and rarely last longer than July 1st.

Heredity.—Beard's pamphlet was the first to show a radical departure from the pollen theory

and to establish that the neurotic habit was an essential factor. He showed that subjects of hay-fever often acquired the affection or the tendency to it through inheritance. The facts sustaining this view are of "a most overwhelming character." Wyman, himself a sufferer, records numerous cases in his own family through four generations. He proved the powerful influence of heredity in many of his cases. It even appears in childhood, he states, and quite generally in those of nervous diathesis. In Dr. Morell's family there were six sufferers from hay-fever besides himself. In the family of Henry Ward Beecher there were two besides himself; and Chief Justice Shaw's family contained seven. Bosworth says that eighteen of eighty cases disclosed direct heredity, while in thirty-nine there was either hay-fever or asthma in the family. Of the forty cases of Sajous', thirty-five per cent. had near relatives who presented clear histories of hay-fever, and forty-two per cent. had asthmatic relatives, while fifty-three per cent. of these cases presented a family history of either hay-fever or asthma. Morell Mackenzie has several times treated father and children for hay-fever at the same time.

Prince relates that five members of the same family were hay-fever subjects. One daughter of thirty years suffered with June cold ever since she was five years of age, every year save 1887, 1888, and 1889. Her grandmother, mother, and two brothers suffered alike. The daughter, convinced that mental or nervous influence affected her, in 1887, was treated by the "mind cure," and for three years subsequently was free from her symptoms. When the original mind curist was dead, in the fourth year, the symptoms returned as badly as ever. A "Christian scientist's" influence was tried in vain.

Sex.—There can be little doubt that males are more afflicted than females. Of the early forms of the disease, however, females seem more susceptible than males. Of 433 cases cited by Phœbus, Wyman, and Beard, only 142, about one-third, were females. Of 506 cases gathered from several authors, 342 were males, 164 females. Morell Mackenzie met with 38 cases in males and 23 in females. Men are the more exposed to the exciting causes such as dust, heat, pollen, etc., although females are the more neurotic. The proportion is about one female to three males.

Age.—Only to some extent can age be said to affect the disorder. The liability to hay-fever in the great majority of cases appears before the age of forty. The malady has been reported, however, as occurring for the first time in persons as old as sixty, and persons of seventy and upward have suffered. Of the cases of children who have been attacked the disease had manifested itself in the parents. It would have probably been regarded as a common cold, had not the parents been the subjects of the affection.

Education.—Most all writers on this subject have observed that the disease attacks the better educated classes and those of fair social position. It is rarely met with among the laboring classes. This would seem to emphasize the view that the disease is essentially a neurosis. From the notes of sixty-one cases of hay-fever in private practice, and the sight of many others of which no record was kept, Morell Mackenzie found all the patients persons of some education, and recalled having seen none among his hospital patients. Of forty-eight cases of Blackley, all were educated, and Wyman made the same observation. Holmes has shown that the ignorant classes are not so likely

to recognize the disease as a distinct affection, and apply for medical aid.

Occupation and Mode of Life.—The fact that the rustic is much less subject to this disease than the dweller in the city and town, shows the influence of the mode of life. Farmers and agriculturists, exposed, it would seem, far more to the exciting causes than others, are peculiarly less liable to suffer from it. Beard reports only seven such cases among 200. Morell Mackenzie states that it is impossible to tell whether the villager owes his exemption to the maintenance of vigorous health by an outdoor life, or to habitual exposure to the cause of the complaint.

Holmes admirably points out that “a part of the mysterious origin must be set down to the indifference of the sufferers who, from year to year, have forgotten their periodical affection and failed to consult physicians.” He says: “Of similar cause is the groundwork of the assertion that it affects only the wealthy. This is simply because with this class there is a higher intelligence and closer attention to ailments, and the fact that having once discerned the actual condition, they, in many instances, take professional advice or go to a place

of refuge, thus drawing notice to themselves, all of which things are denied to the lower (poorer) classes. It is said that there are some 200,000 sufferers in the United States, at least within the range of observation of the Hay-Fever Association, which, meeting annually at Bethlehem, N. H., may be held to represent the more stable and well-to-do. From my own experience and observation I am convinced that there are many of our working people who suffer from this affection who do not even recognize the disease." Merchants, professional men, persons of sedentary habits and brain workers supply most of the victims. The disease is not so uncommon among hospital outpatients here and in England as formerly.

The Neurotic Theory.—Concerning the influence of the neurotic tendency, Beard pointed out, in 1876, two popular misconceptions of the nervous theory, first, that nervous susceptibility implies debility and emaciation, whereas the nervous temperament is consistent with great strength and power of endurance, especially when combined with the bilious and sanguine temperaments; and, second, that the nervous theory dispenses entirely with the influence of exciting causes, as heat,

pollen, etc. Beard concluded that the disease is a complex resultant of a nervous system especially sensitive in this direction and acted upon by the enervating influence of heat and by any one or several of a large number of vegetable and other irritants, and this view has the advantage over other theories in that it accounts for all the phenomena exhibited by the disease in this or in any other country. He believed that the transmissibility of the disease from parents to children; the temperaments of the subjects; the capricious interchange of the early, the middle, and the later forms; the periodicity and persistence of the attacks and their paroxysmal character; the points of resemblance between the symptoms and those of ordinary asthma; the strange idiosyncrasies of different individuals in relation to the different irritants; the fact that it is a modern disease peculiar to civilization; the fact that it most abounds where functional nervous disorders are most frequent and is apparently on the increase *pari passu* with other nervous diseases; and, finally, the fact that it is best relieved by those remedies which act on the nervous system,—all these otherwise opposing

and inconsistent phenomena are by this hypothesis fully harmonized. Prince remarks that although a nervous origin has been recognized by some, still no theory has been proposed to show the connection between the physical symptoms and the nervous processes nor the pathology of the nervous processes themselves.

Vasomotor susceptibility has been viewed as indicating the neurotic tendency, and this may or may not be due to a central lesion. John N. Mackenzie regarded disordered functional activity of the nerve-centers as the expression of the nervous origin. Again, a general neurosis disposing to vasomotor disturbance of the sympathetic and the trigeminus nerves has been held responsible. Kinnear speaks of two forms,—one a hyperemia, and the other an anemia of the sympathetic ganglion. Bosworth is inclined to think a peculiar lack of vasomotor control characterizes the neurotic manifestations. In asthma there is undoubted vasomotor paresis of the blood-vessels of the bronchial mucous membranes, while in hay-fever it is of the nasal mucous membranes.

Solis-Cohen regards hay-fever as generally a neurosis, primarily a vasomotor ataxia or idiosyn-

crazy. Another view is that it may be due to an organic alteration of the nerve-fibers terminating in the nasal region and chiefly in three reflex areas. Again, that it may be due to functional activity or paresis of the governing (vasomotor) centers, accompanied by hyperexcitability of the erectile (cavernous) tissues aroused by peripheral irritation. The phenomena of the cavernous nasal tissue, though secondary to the centric condition, indicates a vasomotor disease. Hack and Robinson believe the morbid lesion is one of neurotic disposition with hyperesthetic condition of the olfactory and fifth pair of cranial nerves.

Idiosyncrasy.—Analogous to the neurotic habit is idiosyncrasy. Apparently the same understanding as to what an idiosyncrasy is has underlain the use of this word by various writers who have advanced idiosyncrasy as a cause of hay-fever. Morell Mackenzie, in 1880, put it down as a predisposing cause, but does not say upon what the idiosyncrasy depends, whether upon some local abnormality, the capillaries, the nerve-centers, or the periphery of the nerves.

In 1897 S. Solis-Cohen said idiosyncrasy is a real condition in hay-fever, and cited the idiosyn-

crasies to salicylic acid, quinin, ipecac, opium, etc., as similar to idiosyncrasies that patients exhibit toward the different irritants capable of producing hay-fever. Using the word to express the fact that certain persons react differently from most of mankind to certain forms of irritation, it means something. It means that such persons are abnormal, although the cause of the abnormality remains to be discerned. Holmes, speaking of idiosyncrasy, would not say there is no such thing as idiosyncrasy, but as far as hay-fever went, he held that the disease was an actual one, the nature of which was not yet comprehended. He remarks that it is quite probable that uric acid would aggravate hay-fever as it would any other condition in the body; and that some think to have proved this by the use of salicylic acid, to which drug many persons have an idiosyncrasy, thereby aggravating the condition in hay-fever by the elimination of uric acid.

Dr. Samuel Ashhurst, in 1897, recorded his habit of regarding hay-fever of late years as a personal idiosyncrasy acted upon by some irritant, and observed that without this personal element it is difficult to account altogether for the symptoms and their peculiar periodicity.

Local Disease Theory.—In 1882 Daly advanced the theory of the local disease as causative of hay-fever, and reported a case in which the patient recovered after the removal of a nasal polyp, which by continuous mechanical irritation had doubtless given rise to the condition underlying. Examinations of the nares of hay-fever patients have repeatedly failed to show any local disturbance other than general congestions. Daly's theory was subsequently accepted and supported by Hack and Roe, who both affirmed that the influence of a morbid condition of the nasal mucous membranes favored the development of hay-fever. In 1883 Sajous and Herzog wrote important papers to prove the same facts. In the same year J. N. Mackenzie demonstrated that "there exists in the nose a well-defined sensitive area whose stimulation through a local pathologic process, or through an extra irritation, is capable of producing an excitation which finds its expression in a reflex act or in a series of reflected phenomena." He located this area at the posterior end of the inferior turbinated bones and corresponding portion of the septum. It has since been held by advocates of the local theory, that

diseases and abnormalities of the nose, such as a markedly deviated septum, outgrowths from the septum, hypertrophic rhinitis, enlargement of the inferior or middle turbinated bodies, mucous polypi, and marked turgescence of cavernous tissue on the inferior turbinated body, were all provocative of hay-fever paroxysms.

In 1884 Harrison Allen declared that the primary lesion was one of **obstruction**, temporary or permanent, in one or both nostrils, from one of various causes, attended by vascular dilatation. Bosworth likewise held that the existing morbid condition of the intranasal tissues must be one of an obstructive character, tending to produce in itself vascular dilatation. Regarding nasal polypi, occasionally considered as active causes of hay-fever, Bosworth concludes that they are rather a result than a cause, since the great quantity of outpoured serum makes the nasal mucous membrane sodden or water-soaked, and in this way myxomatous degeneration develops, eventually assuming the form of polypi.

J. N. Mackenzie, however, examined the nares of many sufferers from hay-fever without finding any nasal lesion. Holmes noted an instance most

carefully reported, in which, with cold snare and galvanocautery, all obstructions were removed, and areas rendered anesthetic so that a probe no longer excited reflex symptoms, yet the patient suffered from hay-fever with scarcely diminished intensity. He further observes that at least a degree of the condition might be the result and not the cause, the peripheral susceptibility being an outward expression of an inward state.

In 1885 Thornwaldt, in Wiesbaden, in his observations on nasal catarrh, assumed that nasopharyngeal disease might not only give rise to symptoms simulating nasal disease, but was likely the actively predisposing cause of asthma and hay-fever. Bosworth agreed with him as far as hay-fever is concerned.

The Uric-Acid Theory.—In 1893 Seth S. Bishop announced to the American Medical Association that “an excess of uric acid in the blood causes hay-fever, or nervous catarrh.” Uric acid in the blood in marked excess of the normal relation to urea, of about one to thirty-three, causes certain disturbances of a vascular and neurotic character. In health, five to eight grains of uric acid are secreted every twenty-four hours. Haig

claimed that an effect of an excess of uric acid is contraction of the arterioles and capillaries all over the body. He found that by diminishing the alkalinity of the blood it was freed from uric acid, the arterioles were relaxed, and the headaches and mental depression were relieved. Cerebral anemia has appeared to obtain in hay-fever, and the attacks were relieved, Haig found, by such remedies as relieved anemia of the brain, *e. g.*, amyl nitrite, coffee, and other cerebral stimulants. These views of Haig were concurred in by Thomas J. Mays, Murchison, Conklin, Ebstein, Quinquaud, and others. Bishop, in 1894, remarked that the blood in the morning is more alkaline than at any other time of the day, being, at about nine o'clock, at its greatest point of alkalinity, which would seem to account for those attacks of hay-fever which came on early in the morning, and which in some instances were ascribed to the influence of light. He was of the opinion that not only an excess of uric acid in the system, but also an increased formation thereof should be regarded in the treatment of hay-fever. Bishop also claimed that the uric-acid theory was not antagonistic to the essentially neurotic character of the

disease. He also advanced that the primary determining cause of the particular manifestations in this disease is an inherent, perhaps hereditary, susceptibility of the nervous system. In this way only can we account for the fact that the same subjective or objective exciting cause (uric acid or pollen) will produce one train of distressing symptoms (nervous coryza) in one individual, and an entirely different one in another (asthma). This uric-acid hypothesis explains why some persons suffer from attacks under certain conditions in winter as well as during the warm months. It also unifies all the forms.

Bishop says: "The uric-acid theory of hay-fever is not antagonistic to the present status of medical opinion or surgical treatment, but, on the contrary, it explains questions that were inexplicable before. As a tumor or hypertrophied bone may give rise to convulsive seizures in epilepsy, and as its removal may be followed by relief when no other structural cause exists, so in hay-fever, when new growths and other lesions of the nasal mucous membrane are present, the attack may be started by the accumulation and the sudden setting free of uric acid. This pre-

cipitates the paroxysm by its irritant action, which finds expression in the group of symptoms characteristic of hay-fever or asthma, instead of some one of the other allied diseases. The particular form of manifestation may be determined by the growth or the seat of irritation located in the nasal cavities. When this is the only determining factor of the nature of the morbid symptoms, no other disease having resulted from the long-standing trouble, the removal of such a peripheral source of irritation may give relief from these symptoms, but it may not prevent the uricacidemia from switching off into other kindred lines of disturbances, if it be not corrected."

Capp, in advancing a new view, inclines to the uric-acid theory, and alludes to a certain spastic condition not mentioned by other writers, which, although slight in character, is general, rather than confined to limited areas, and in a large measure accounts for many manifestations of the disease. A central nervous irritation is probably caused by the presence of a disturbing element in the blood, presumably products of imperfect metabolism not eliminated. This may originate

nerve-currents with innumerable reflexes, which, in the disturbed equilibrium of the system, are, in a measure, uncontrolled by the ordinary inhibition.

Holmes has very cleverly pointed out a fallacy in regard to the evidence advanced to substantiate the uric-acid theory. He states that some investigators by the use of salicylic acid and various acids to diminish the alkalinity of the blood thus eliminating uric acid, have, thereby, actually aggravated the condition in hay-fever, which aggravation has been thought due to excess of uric acid in the tissues, or increase in its production, instead of being due to the idiosyncrasy to salicylic acid, etc.

In 1897 Grayson stated that even if we grant that a certain number of hay-fever patients are unquestionably people of a neurotic temperament, while others are gouty, can not we profitably look beneath these titles and recognize the fact that they are dyscrasias, which are merely different offshoots from a parent weed that is rooted in defective nutrition? By defective nutrition is meant all the phenomena of metabolism,—constructive, destructive, and eliminative. Disturb-

ance of one means disturbance of all. With continued absorption of toxic materials from the intestinal tube, or with persistent incomplete elimination of the products of suboxidation, it is only a question of time when autotoxemia will provide us with any of the functional neuroses from hay-fever and asthma to chorea and epilepsy.

Grayson says the neurotic habit may exist, but it is not essential to the disease, but the nervous system is implicated as a victim, not as a culprit. He claims that hay-fever is a defect, not of the nervous, but of the nutritive system, because impairment of the digestive and nutritive processes is almost invariably the first downward step toward a general state of lowered vitality. At first gastric, it later involves the whole gastrointestinal tract. He thinks uric acid is almost invariably present in excess in hay-fever subjects. A child having reflex convulsions due to acute indigestion is not a neurotic subject, yet the vasomotor perturbation of the hay-fever patient differs from that of the child mainly in point of chronicity.

Grayson concludes that the three factors which make up the etiologic combination of hay-fever are: An external irritant, some intranasal abnor-

mality, and a constitutional element—"defective nutrition." The physician unaided can not restore the nose to a state of health. In order to overcome the self-indulgence of the patient, regularity is recommended in eating, work, and play, while indiscretions of diet, lack of exercise, objectionable fancies in matters of clothing and bathing, and, finally, vicious excesses—alcoholic, narcotic, or sexual—will require the constant and most determined effort of the patient himself. The whole environment of the patient must be separately studied and provided for in the dietary scheme. A comment on this treatment is: "While it is true that if a man takes care of his muscles his nerves will take care of themselves, there is no closing of the eyes to the fact that to the average man exercise is distasteful; therefore, it is the more necessary to be explicit in instructions concerning it. Though there is nothing brilliant about this method of removing the constitutional factor of the disease, what it lacks in brilliancy is more than made up in certainty, and if the patient is possessed of grit and determination it brings a sure reward."

J. Müller thinks there is a causal relation

between hay-fever and gastro-intestinal symptoms, but he also holds that it can be proved that pollen entering the respiratory tract is the cause of the disease. A "sufferer," writing on the disease, says: "Indigestion is a most potent cause in many instances, and proper food, properly digested and assimilated, has permanently relieved more than one." But he does not say he himself was relieved, nor does he give cases.

It is questionable whether or not the digestive disturbances are not effects rather than causes of the disease. It is not at all doubtful, however, that lowered resistance and a depreciated vitality may result from difficulty in the gastro-intestinal tract. Such difficulty may suffice to start the chain of hay-fever symptoms.

TIME OF OCCURRENCE.

On the continent of Europe, where it is less frequent, and in England hay-fever prevails in June and July. The initial attacks occur during May and June and seldom last longer than September. In India the malady chiefly occurs in February. In Australia, in and around Adelaide, where the disease prevails, it occurs chiefly in September during the time of the blossoming of the Cape weed. In his work on hay-fever, Beard essays to show how the autumnal form is peculiar to the United States. One cause seems to be the flowering of the Roman wormweed and the pollen of corn about the middle of August, and another in the prevalence of the "dog-days." A third reason lies in the fact that there is less atmospheric ozone and electricity at this period than at any other time of the year, and, again, the hottest days are frequently in the latter part of June. Beard also attached importance to a variety of hay-fever in which the attacks came on in September. This distinction is probably due to the fact that while one person is liable to the action of

one pollen, another may be affected by a totally different pollen, and the annual attacks come on when the atmosphere is permeated by a special pollen to which the victim is individually susceptible. Many persons are susceptible to the action of more than one pollen. Patients often suffer from rose colds in early summer, and, again, in August, from the autumnal form of hay-fever. Of the 198 cases collected by Beard the onset of the disease occurred—

From May	1	to May	10,	in	2	cases.
"	"	10	"	"	31,	" 6 "
"	June	1	"	June	10,	" 11 "
"	"	10	"	"	30,	" 8 "
"	July	1	"	July	10,	" 6 "
"	"	10	"	"	20,	" 6 "
"	"	20	"	"	31,	" 7 "
"	Aug.	1	"	Aug.	10,	" 7 "
"	"	10	"	"	20,	" 81 "
"	"	20	"	"	31,	" 54 "
"	Sept.	1	"	Sept.	10,	" 7 "
"	"	10	"	"	20,	" 1 case.
"	"	20	"	"	30,	" 2 cases.

Of Bosworth's eighty cases the greatest number, fifty-one, occurred between August 10th and August 27th. The usual date assigned for the commencement of paroxysms of hay-fever is the 29th of August. This form of the disease, com-

mencing in the latter part of August, is designated as autumnal catarrh.

Many patients have asserted that they are attacked annually on exactly the same date, and even the same time of day, each year. There can be little doubt that the psychic influence or peculiar mental anticipation may have a great deal to do with this circumstance. An attack may be brought on by the influence of the imagination. Phœbus gives the history of a case in which attacks of sneezing were brought on "while looking at a beautiful picture of a hay field." The well-known instance of J. N. Mackenzie, in which an attack of hay-fever was brought on in a susceptible individual subject to rose cold by means of an artificial rose may be explained on this ground. Bosworth considers that the time of occurrence is influenced by psychic causes, and is analogous to the recurrence of chills in intermittent fever, and considers that deception as to the actual time of occurrence might be proved in hay-fever as in intermittent fever, in which changing the hands of the clock may lead to a change in the regular recurrence of the chills. Prince gives the history of a case in which a hay-fever subject under the influ-

ence of autosuggestion, by means of writing frequently on paper and thinking, day and night, in leisure moments, and of slight hypnotism, prevented the premonitory symptoms of hay-fever, and she was free from the annual attacks for several years, when they recurred and continued yearly thereafter. Prince asks, may it not be that the reason why certain places, such as Dublin, for instance, are reputed to have a specific influence against attacks, is the counter-suggestion thereby given that the patient will be free from attacks at such places?

DURATION.

Pirrie states that it is next to impossible to definitely decide the duration of hay-fever attacks, as seasons, age, temperament, locality, treatment, and other circumstances tend to cause variations in different years and in different individuals. Treatment will do much to curtail the duration of the more prominent and distressing symptoms, but if left to themselves it is seldom they depart under three or four weeks. A writer in the "Twentieth Century Practice of Medicine" estimates the duration as from four to six weeks, according to the patient's surroundings and the atmospheric conditions. Asthmatic attacks may last from a few hours to three days and disappear suddenly. Morell Mackenzie states that attacks last from a few hours to several days, or even longer, finally ceasing almost as suddenly as they came, and leaving no trace either in local lesions or in systemic disturbance. Bosworth gives eighty cases, showing the durations of the annual attacks as follows :

From May 1 to frost, 1 case.
 " " 15 " May 25, to July 1, . . . 3 cases.

From May 10 to Aug. 1,	. . . . .	1 case.
“ June 1 “ July 1,	. . . . .	2 cases.
“ “ 1 “ “ 14,	. . . . .	1 case.
“ “ 1 “ frost,	. . . . .	5 cases.
“ “ 10 “ July 4,	. . . . .	4 “
“ “ 10 “ “ 26,	. . . . .	5 “
“ July 1 “ Sept. 1,	. . . . .	1 case.
“ “ 10 “ Aug. 1,	. . . . .	1 “
“ “ 10 “ Sept. 1,	. . . . .	1 “
“ “ 25 “ frost,	. . . . .	4 cases.
“ Aug. 10 “ Aug. 27, to frost,	. . . . .	51 “

All forms of hay-fever terminate with the first frost, and the long interval in which one may suffer is shown by the first case above from May 1st to cold weather. In the United States some who are attacked in May recover by the first of July; some attacked in July are well by the 15th of August; some attacked in August recover by November 1st, while some unfortunates suffer throughout the period from May to November. The June type may be followed by a September visitation or become a permanent August attack, or the August type may disappear in certain individuals and reappear as a June cold.

SYMPTOMS.

Although the affection is called hay-fever, there is seldom any degree of pyrexia, and, as a fever, it is not a decided one. There are two well-known types of the disease,—the **catarrhal** and the **asthmatic**. The onset of an attack is occasionally marked by feelings of general malaise, a loss of appetite, and depression of spirits. Indeed, these symptoms more or less characterize the entire course of the attack. A “tickling in the roof of the mouth” one week before the onset was felt by a patient of Sajous. Another speaks of dull pains in the head and back two weeks before; chills and shuddering ten days before the attack is experienced by another, while a large proportion complain of palpebral pruritus from two to ten days before the onset of the nasal symptoms. It is only in those subjects whose hay-fever is of some years’ standing, Sajous points out, that the **premonitory symptoms** are present, and gives in evidence the testimony of a fellow-physician, viz.: “My attacks for some years past came with much regularity, about August 12th to August 14th.

On these dates this year I arranged to be on the water, on Lake Ontario and the St. Lawrence River, and entirely escaped everything like sneezing and irritation of the nose and eyes. Still I had the usual hot and slightly irritable skin, then an eruption of urticaria, accompanied by disordered stomach. This experience is precisely the same as in 1880, except that then I was on the Atlantic." Macdonald, in 1893, had a patient whose earliest symptoms were a curious coldness and pallor of the nose even in warm weather. In this connection it may be observed that in 1870 Roberts conceived the "pathognomonic symptom" to be coldness of the tip of the nose.

Beard divided the symptoms into local and constitutional. Among the latter he regarded fever, loss of strength, the altered appetite and the nervous system, considering under this last, depression, indisposition to labor, sense of fullness and heaviness of the head, pain in the forehead and behind the ears, partial deafness, restlessness at night, inability to sleep, a sense of suffocation, and general irritability. For the local phenomena, he looked upon the skin, in the heart, chest, mouth and nose, eyes and ears.

The **periodicity** of the attacks is a prominent symptom and is difficult to explain. Some peculiar psychic influence occasionally acts to precipitate an exacerbation. In no other way can we explain the cases of John N. Mackenzie and Morell Mackenzie already cited. Analogous to this remarkable periodicity are those cases of intermittent fever wherein each alternate day, at a given hour, the chill occurs. This is generally true, moreover, not only of ourselves, but of the world around us. As Holmes has beautifully shown in this connection, health and disease afford abundant illustration: The fixation of the number of heart-beats, of the respiratory movements, of the cycle of menstruation, or of the period of gestation are all recognizable in their unfailing occurrence, but their determination thereof, then, rather than at some other period, can not be explained. So, in disease, are the mutations of the enteric temperature, the recurrence of the hectic, of the regularity of the return of the types of ague upon the second, third, or fourth days, or of hay-fever upon its annual date. We must recognize these phenomena as fixed, further we can not go. "As the rhythm of physiologic effects is under

the control of the central nerve ganglia, and as intermittency is a peculiarly marked feature of so-called nervous disorders, so far the annual return and the variations are evidences of the neurotic origin of hay-fever."

The onset of an attack of hay-fever begins with a sense of irritation referred to the upper nasal chambers, a sense of fullness or tightness across the bridge of the nose. There is an itching or burning sensation of the inner canthus of one or both eyes, which may be accompanied by convulsive movements of the eyelid, an itching or tingling in the roof of the mouth. Spasmodic sneezing soon occurs, and pain in the eyeballs and in the frontal regions develops. The paroxysms are more or less violent and prolonged. Arnold tells of sneezing in a patient for twenty-five times in close succession, forcing the pulse at the height of the attack to one hundred and twenty beats to the minute. These paroxysms are followed by an abundant, thin, serous discharge from the nose. The mucous membrane of the nasal fossæ swells so as to block up the nasal passages, and respiration through the nares becomes impossible. The escape of serum from the

nostrils seems to increase the intense irritation and makes the sneezing worse. The **discharge from both eyes and nose** gradually grows thicker and may become semipurulent. There is often a certain amount of **chemosis**, and sometimes **photophobia**, besides the usual pricking and stinging of the conjunctival surfaces. There are frequent transient paroxysms of **lacrimation**, and there is often much swelling of the eyelids as well as of the conjunctivæ. The **face** becomes puffy and edematous, and the senses of **taste** and **smell** become impaired. The **pharynx, mouth, and tonsils** share in the engorgement and become red, and simultaneously the inflammation of the eyes, nose, and throat becomes intense and painful. **Swallowing** may become so difficult that there is little rest night or day. **Insomnia** is common and is often attended by nervousness and a sense of suffocation out of all proportion to the gravity of the condition. **Cough** is not a constant feature, but in a considerable proportion of cases it comes on in the second week, and lasts through the attack. Generally it is spasmodic and so incessant at night that sleep is impossible, and there are soreness and pain resulting from the straining

of the diaphragm and intercostal muscles. **Bronchitis** does not usually result, and expectoration is absent or scanty until late. Cough may continue after all other symptoms have ceased. The **pulse** and **temperature** are not generally altered, but later in the attack the temperature may be raised two or three degrees, doubtless from disturbed rest. A "sufferer" records that, in some, the **genito-urinary** and **rectal** passages give the first warning by intense itching and burning. In one instance, a more than generally severe paroxysm induced rupture of the capillaries in the lacrimal caruncle of the right eye, causing engorgement of the organ and displacement of the visual axis, with consequent double vision for some days. The direct and reflex **changes in the vocal apparatus** vary from loss of timber and harshness to complete inability to utter nasal vowels and consonants.

The disorder varies much in intensity even in the same person within short intervals of time, so as to almost give an intermittent character to the complaint.

COMPLICATIONS AND SEQUELÆ.

The attack finally ceases almost as suddenly as it came on, leaving no trace of local lesion or systemic disturbance. It is accompanied in some patients with nettle-rash. Asthma is a late symptom, coming on after the acute symptoms have abated, and cough has existed for some time. It may appear at the height of the attack. It is more common in autumnal catarrh than in the early forms. Its period, as a rule, begins at the fourth week, and it does not vary from ordinary asthma. It is sometimes periodic, occurring at the same hour night after night. Paroxysms appear associated with antecedent bronchial rather than nasal symptoms. Nasal reflex phenomena, without cough, may occasion paroxysms. Persistent cough more usually exists in the intervals between paroxysms. Beard says that four-fifths of the sufferers have cough or asthma. The symptoms are not usually of equal severity each year. Asthma generally comes on in the daytime, a littleropy mucus being expectorated, and later, an abundant frothy secre-

tion. There may be only a slight remission, the dyspnea continuing so long as exposure continues. The attacks rarely produce emphysema of the lung, and sooner or later recovery ensues. Bosworth estimates that the asthmatic attacks come on earlier each year in those who have suffered from hay-fever in connection with asthma, and he believes that an attack of hay-fever is especially liable to develop an attack of bronchial asthma as a natural consequence of the disturbance in the nasal chambers. He also observed a number of cases in which hay-fever symptoms gradually abated while the asthma became a prominent factor, and, again, that victims of hay-asthma finally acquired the perennial form of the disease,—the attacks occurring at all seasons without reference to the presence of pollen in the air.

As already evidenced in Sajous' case, in a number of cases the attacks are preceded by **cutaneous eruptions**. Laflaive cites cases with urticaria and eczema preceding the onset of hay-fever. Facial pruritus and herpetiform eruptions are occasionally seen. J. N. Mackenzie speaks of an inflammation of the **external auditory**

meatus in all respects analogous to that of the nose in hay-fever, occurring repeatedly in a lady during the summer months.

Besides asthma, already mentioned, there is little tendency to permanent ill-effects except thickening of the nasal mucous membrane from the prolonged irritation. **Taste** and **smell** may be impaired during and for a long time after the attack. General irritability and nervousness may be more or less persistent. Elderly sufferers for a long time may have weakened hearts which intermit during attacks, which may recover with returning health or result in **cardiac dilatation**. Wyman mentions **pneumonia** in three cases during attacks. In one case the catarrh ceased for two weeks to return after the pneumonia disappeared, when asthma also came on for the first time.

PATHOLOGY.

Morell Mackenzie states that hay-fever, leaving no permanent structural lesion behind it, can not, therefore, be strictly said to have any pathology. Surely it is that **no distinct specific organisms** have been found. Sajous calls attention to the distinct physiologic functions of the **two regions** of the nasal cavities, the olfactory and the respiratory. The filaments of the **olfactory** nerve cover the superior turbinated bones, and the upper third of the middle turbinated bones, and the corresponding portion of the septum. Thus the upper portions of the nasal cavities are devoted to the sense of smell and do not enter into the pathology of hay-fever. The **respiratory** portion of the nose includes all the surfaces below the olfactory. It is under the control of the vasomotor nerves of the sympathetic system, and is quite sensitive to local or peripheral irritation. This sensitiveness resides in the terminal filaments of the sensory nerves, distributed over the surfaces of the mucous membranes. The membranes of the posterior areas of the nasal fossæ are supplied with several branches

of the sphenopalatine ganglion, which enter by the sphenopalatine foramen. This ganglion possesses a sympathetic root derived from the carotid plexus through the vidian nerve, thus establishing a connecting link between the nasal mucous membrane and the sympathetic system.

In health the nasal mucous membrane pours out from twelve to sixteen ounces of watery serum daily, which—that it may warm, moisten, and cleanse the inspired air on its passage to the lungs—is diffused over the convex surfaces of the turbinated bones. The centers in the medulla, through the vasomotor, control and regulate this process of serous exudation; the nicety of which regulation is seen in the adjustment thereof to the varying hygroscopic and thermic conditions of the atmosphere.

The experiments of John N. Mackenzie, in 1884, showed:

1. That in the nose there exists a well-defined sensitive area whose stimulation, through a local pathologic process or through an extra irritation, is capable of producing an excitation which finds its expression in a reflex act, or in a series of reflected phenomena.

2. That this sensitive area corresponds, in all probability, with that portion of the nasal mucous membrane covering the turbinated corpora cavernosa and the most sensitive spots covering the posterior end of the inferior turbinated body and the septum immediately opposite.

3. That nasal cough is caused only by stimulation of this area.

4. That the tendency to evolution of reflex phenomena varies in different individuals, and is probably dependent upon the varying degree of excitability of the erectile tissue.

These sensitive areas correspond to the distribution of the sphenopalatine branches of the superior maxillary nerve, as distinguished from the nasal branch of the ophthalmic, which latter supplies the more anterior portions of the nasal fossæ. The former nerves, derived through the ganglion of Meckel, therefore, probably contain the vasomotor nerves which govern the erection of the turbinated tissue, and, hence, the localization of the sensitive areas becomes the key to the mechanism of the paroxysms. Nevertheless, Beard was inclined to transfer the point of greatest excitability from the peripheral ends of the nerve filaments to

the nerve-centers themselves, because it seems a more comprehensive explanation of the varied phases of the disease.

Roe explained that the more frequent occurrence of asthmatic paroxysms at night might be brought about by the gravitation of blood to, or the contact of polypi upon, these sensitive areas. Sajous thought it was evident that there were three areas capable of producing reflex symptoms in the course of a paroxysm of hay-fever, and that the three combined formed the key to the local nervous element, not that the three areas must take part, but in some, one of them, in others, two of them, etc. In the asthmatic cases, he noticed that both anterior and posterior areas were sensitive, the latter especially so.

Capp pointed out two distinct spots or areas of the mucous membrane of the nasal cavities, one at the posterior and one at the anterior extremity of the inferior turbinates, one or both of which may be supersensitive in individual cases; also a spot in the anterior nasal chambers at the upper angle formed by the septum. All these are exquisitely sensitive, and, when irritated, produce extensive reflex symptoms. Trouble appears to

begin at one or all of the points, while the rest of the Schneiderian membrane is in normal condition; but with sneezing, hyperemia and hyperesthesia ensue, and, through continuity, may extend to throat, ears, and eyes.

In speaking of the three reflex areas, Holmes said that it is regarded that all points of the cavernous tissue are not equally susceptible to irritation; the sensitive areas are the inferior turbinates (the posterior and middle reflex areas) and the portion of the septum immediately opposite, being particularly related to cough and asthma; the anterior, in the vestibule, to sneezing, lacrimation, and other catarrhal symptoms. We might compare these reflexes with certain other cases of reflex asthma (not hay-fever) benefited by removal of the tonsils.

Bosworth regarded the continuous sneezing as pathognomonic and holds that the hyperemia is "confined entirely to the large venous sinuses, the capillaries proper not being congested," and speaks of the watery, serous discharge with the bluish-gray "tinge of the mucosa verging on opalescence, the surface of the membrane being covered with slightly viscid, watery

serum, which gives it a glassy, semitranslucent aspect."

During an attack of hay-fever the **erectile tissues** of the nasal passages and the posterior throat become distended, the blood-vessels are engorged, groups of lymph-cells fill the lymphatic spaces, the mucous surface is crowded with migrating leukocytes (white blood-corpuscles), younger epithelial cells are vacuolating and proliferating, secretion is increased in quantity and altered in character and composition, sensation is heightened, intensified, altered, or benumbed, and the whole metabolism of the affected region is profoundly disordered. Examination of the lower borders of the turbinated bones will disclose the mucous membranes of the nasal cavities arranged in thick, loose folds, owing to the peculiar distribution of the network of arteries and veins which go to make up "**cavernous tissue.**" It is peculiar to this tissue that it may suddenly be engorged with blood, extremely distending it, and as suddenly emptied and the engorgement relieved. It is especially thick over the inferior turbinated bones and over the lower and posterior part of the nasal septum, and also upon the lower edge of the middle turbinated

bone. In acute conditions the engorgement and distention soon subside. In chronic states the mucous membrane becomes markedly thickened and the blood-vessels enlarged and tortuous. The subsidence of the engorgement can not occur, and as a result there is a greater or less degree of closure of the nasal passages.

The mucous membrane of the nasal cavities in hay-fever does not present the characteristic features of an acute inflammation. The impact of pollen or exciting irritant causes complete relaxation of the large veins of the turbinated bodies and an exudation of serum, which relaxation continues so long as pollen or the irritant is *in situ*, but as soon as it is removed the normal caliber is again restored and the attack subsides. Deviations of the septum or chronic rhinitis are occasionally found concurrent with the disease, but can not be regarded as characteristic.

DIAGNOSIS.

Hay-fever may be distinguished from asthma, common catarrh, bronchitis, acute rhinitis, remittent fever, and catarrhal conjunctivitis. The salient feature of hay-fever is its periodicity or annual recurrence. This is part of its very nature, is the central point of diagnosis, is its chief characteristic, and to its elucidation, Holmes says, all existing theories tend. Beard states that hay-fever is like asthma in the following points:

1. It is hereditary;
2. It is more or less periodic;
3. It is paroxysmal;
4. It is correlated to other functional nervous affections;
5. The paroxysms are excited by great variety of irritants; persons being differently affected;
6. It is singularly obstinate and is relieved by the same remedies.

Bosworth considers hay-fever dependent upon:

1. A neurotic habit;
2. Pollen in the atmosphere;
3. A disordered condition of the nasal passages.

While asthma is dependent upon :

1. A general neurotic condition ;
2. Obscure conditions of the atmosphere ;
3. Diseased bronchial (not nasal) mucous membranes.

It is the comparative suddenness of the onset as well as its sudden departure, the violent paroxysms of sneezing, and the character of the nasal discharges which are the peculiar features of hay-fever. The first attacks are likely to be mistaken for ordinary *coryza*, but here the abrupt onset, the characteristic edematous puffiness of the eyelids, the absence of constitutional symptoms will indicate the difference. In children, moreover, attacks of hay-fever are most liable to be mistaken for acute colds or rhinitis,—but here, again, the above points may serve to distinguish, together with the sequence of the symptoms, the time of year, and the physical signs of an acute bronchitis, if it extends so far. The approach of cold weather and the coincident departure of the symptoms will make clear a diagnosis, while the history of previous attacks at the season of the year most favorable to hay-fever, the presence of certain irritants, and the general condition of the bodily symptoms

may be of aid in distinguishing the affection. In acute rhinitis there are several stages, viz.: First, a dry stage, lasting for a few, say twelve, hours; second, a serous discharge lasting two or three days; and, third, a mucopurulent discharge for from three to five days,—while the entire attack runs its course in from five to ten days if no complications ensue. In hay-fever there is no dry stage; the discharge from the outset is purely serous and never mucopurulent during the entire course. The nasal discharge in hay-fever is sometimes slightly opaque, and it may contain some few epithelial cells and viscid mucus. In acute rhinitis examination of the nares will show an inflammatory area while hay-fever shows none. Hay-fever is a vasomotor paresis, and is easily diagnosed from inflammatory coryza by the swollen bluish-gray appearance of the inferior turbinated bones, and by the fact that the first train of symptoms continues through to the end. Examination of the nares will disclose occlusion due to the swollen turbinated bones lying in contact with the septum. The appearance of the mucous membrane itself is characteristic and only slightly resembles an inflammatory process. It is mark-

edly swollen, not bright red as in rhinitis, but bluish-gray, covered with a thin, slightly viscid, watery serum, giving it a glassy, semitranslucent, at times opalescent appearance. Again, the marked puffiness of the eyelids, the great suffusion of the eyes, the photophobia, and even epiphora are distinguishing features of hay-fever.

The sensitive areas spoken of, particularly those on the lower and posterior parts of the septum and the inferior turbinated bones, are of value in differentiating hay-fever, and the markedly pronounced paroxysms of sneezing are very prominent in hay-fever.

People are subject in the changeable climate of spring and early summer to catch colds, and especially is this true of those prone to catarrh. These cases are sometimes mistaken for hay-fever. The readiness, however, with which they yield to anti-catarrhal treatment shows their nature.

PROGNOSIS.

The prognosis is invariably good as to life. Sufferers often live to advanced ages. Hay-fever is **no bar to life-insurance**, but unless rationally treated the chances of permanent cure are very small. There are few exceptions to the rule that the tendency is, when once established, to an annual recurrence, unless the predisposing causes are removed, or there is removal of or away from the exciting cause. Beard states that hay-fever has **no effect on longevity**, and that, judging from observation and analogy, this affliction may act as a kind of safety-valve for the nervous diathesis, preventing other and more serious disorders, and thus becoming the friend rather than the enemy of life. When once attacked, unless properly treated, escape is rare in any subsequent year. Even changes in constitution in extreme age are no bar or protection. It rarely skips a year, provided locality and influence are the same. Absolute immunity is only obtainable at the price of temporary exile. There is no proof that hay-fever is generally milder or

severer in certain years all over the world or over a country, yet evidence is satisfactory that in certain localities it varies greatly in different years.

Now and then, but not often, the tendency to the disease seems to be outgrown. In one of Beard's cases the disease skipped two years. Dr. Gibbons, of California, mentions a terrible case in which the attacks in successive years became lighter and lighter and finally disappeared entirely.

With respect to increase or decrease of severity of symptoms with advancing years there is no constant law. In some cases the disease grows milder, in others severer, in others still, years of comparative mildness alternate with years of comparative severity. The early form may change into the later form. There is no doubt, however, that attacks may change from the early to the late form, and *vice versa*, and in advancing years may be milder. Bosworth states that the younger the patient the better is the promise of relief; and that rose cold, belonging more especially to early life, is to be regarded more favorably than other forms. Macdonald

has observed spontaneous disappearance in children, perhaps due to an increase, *pari passu* with growth and development of nervous stability.

As regards the **termination of each individual attack** the prognosis is invariably favorable; *cesante causā, cessat effectus*. There is almost equal certainty that with the same causative influences the attacks will reappear upon exposure to the exciting cause. It is peculiar, too, that the disease of one year's standing has proven as obstinate as one of from twenty to thirty years' duration. In these instances, it may be a question as to how firmly fixed has become the neurotic habit.

W. W. Bulette, of Colorado, in 1896, as a result of his own experience, made the assertion that more than eighty per cent. of hay-fever sufferers can be permanently and effectually cured. Thorough examination of the patient and elimination of every possible source of irritation and pathologic condition is necessary.

I desire to be more emphatic, and from my results in the treatment of over 200 cases during the last ten years, I believe that the curability of the disease can not be questioned. That all cases can be cured is questionable; but we can unhesitatingly say that a

majority of cases are curable, and that positive relief, without change of residence or inconvenience, can be afforded during the period of occurrence, if treatment is directed along the lines laid down in the following chapter.

TREATMENT.

The proper treatment of hay-fever has always been a subject of many and diverse opinions; and the so-called specifics have been as numerous as the theories of causation. From time to time, nearly every drug in the pharmacopeia has been employed; and many have been fashionable for a very brief period and finally abandoned. The antiseptics, the antispasmodics, the escharotics, the astringents, and the sedatives have one and all had their advocates, have flourished and fallen into disuse. Early in my experience in the treatment of hay-fever I followed one authority after another, shifted from drug to drug, until finally I employed almost exclusively in uncomplicated cases the simple methods herein described. During the last ten years I have had under my care over 200 well-marked cases of hay-fever, of which I possess, in nearly all, complete histories, and I have not failed to relieve a single patient who has persisted in the treatment. I not only prevented the paroxysms, but subdued their violence and controlled the attacks when well established. I am free to confess that I secured

success rather empirically, and not until many stubborn cases had yielded could I deduce satisfactory conclusions.

The logical parallel of my methods is found in antiseptic surgery. The ponderous technic of Lister is now replaced by simple antiseptics or surgical cleanliness; so the simple, though strict, sterilization of the nasopharynx is often the certain means of arrest of the painful phenomena of hay-fever. By a *daily sterilization* of the nares and post-nasal spaces the victims of hay-fever may remain in the city attending to their usual duties, surrounded by dust, or in the country amid blooming flowers, without any fear of the distressing symptoms—a consummation devoutly to be wished for by the great army of hay-fever sufferers.

Some years ago, in the dispensary, I had made a somewhat prolonged bacteriologic study of the nasal secretions of young children waiting for treatment for various simple disorders, and it was found that although a child might have no constitutional indication of infection whatever, often the bacteria of diphtheria, pneumonia, or tuberculosis, as well as many unrecognizable forms of micro-organisms, were present in the nasal secretions.

Thus I was led to appreciate the well-known fact that the various bacteria deposited in limited numbers on healthy nasal mucous membranes ultimately perish. Unless the general vitality and resistance of the mucous surfaces are lowered by internal causes, or an entrance is made through some local lesion, possibly the result of previous disease or injury, unhygienic environment, or overwhelming exposure, hay-fever will not occur. Conceded that an external irritant is necessary to cause the disease, to prevent or cure it we must either prevent the irritant from reaching the points of exposure, fortify these vulnerable spots, or remove or render inert the irritant when already lodged. In hay-fever the vulnerable spot is undoubtedly somewhere within the nasopharynx. It is now conceded that the nose and throat are channels for the entrance of the bacteria of many infectious diseases; and I feel sure that as I have limited the extension of house-epidemics of scarlet fever, diphtheria, whooping-cough, and measles by a carefully conducted antiseptic toilet of the nose and throat, in the same manner I have prevented the dreaded paroxysms in cases of hay-fever.

All writers on this subject advocate vaguely the

treatment of the nose and adjacent parts; but almost invariably definite nasal treatment is directed to previous local disease or to the employment of escharotics, astringents, or anesthetics. Antiseptic solutions are advised for their local action rather than with an idea of cleansing the nares, and are used in quantities too small to remove or render inert the irritant. Removal from the source of irritation—a complete change of environment during the period of recurrence—has been the best prophylactic means previously at our command, but this is most inconvenient and impracticable to many of the sufferers. Equally impracticable is such an alternative suggestion as that of Morell Mackenzie, that when people can not flee to the mountains or the mid-ocean they should remain indoors, and “if they must go out they ought to plug the nose with cotton-wool and protect the eyes by wearing spectacles with large frames, accurately adapted to the circumference of the orbit.” I offer as an acceptable and reliable substitute for the change of climate a simple local treatment.

The infection and disturbance of the nasal mucous membrane is undoubtedly the exciting

factor in originating the paroxysms, and to this we must confine our efforts early if we are to gain any success in treatment.

The first step in the local treatment is to learn, by careful examination of the nasal chambers, whether we have present any abnormal condition which renders their mucous surfaces supersensitive, or any well-marked defects, such as polypi, deviated septums, or hypertrophies. Frequently a simple chronic rhinitis precedes a tendency to permanent turgescence of the whole nasal chamber; in such a case a free cleansing of the nasal mucous membrane is quite easy, but when we have a polypus blocking the way, or a badly deviated septum, progress in treatment will be slow. I believe that, as a rule, local disease is only incidental and not in any way provocative, except as it renders the surrounding mucous membrane unhealthy, thus inviting infection and precipitating the true paroxysms.

However, any abnormal condition existing in the nasal avenues must be corrected so far as possible, because it renders complete sterilization of these parts difficult or impossible, and weakens the normal resistance of the mucous membrane, thus

inviting periodic infection. I believe that the acute infective diseases, particularly in children, may be prevented by most thorough and repeated sterilization of the nasopharynx, and just as house-epidemics are never excusable evils so I claim the same to be true of hay-fever.

Local Treatment.—The important result to be obtained through treatment is the prevention of the paroxysms, and, ultimately, the entire removal of the recurring *habit periods*. Years ago I was led to treat my hay-fever patients suffering with watery nose, weeping eyes, and bronchial and frequently asthmatic cough by cleansing the nasopharynx with a hand-ball atomizer containing a warm solution of boric acid (ten grains to an ounce of water) or Dobell's solution, after which I carefully wiped the mucous membrane and applied menthol and liquid cosmolin freely to the parts. This procedure afforded considerable temporary relief in a large number of cases when there was present simply turgescence of the whole nasopharynx. When, however, polypi or evident hypertrophies existed this treatment was not sufficient. After the polypi were removed or the hypertrophic tissue destroyed I would continue

the alkaline wash, practising the sterilization and applications to the parts with my oily solution. It would be a long story to trace in detail the gradual abandoning of one drug after another from the mildest alkaline wash up to the strongest caustic application of Williams—the solution of the iodid of mercury of the strength of 1 : 1000 up to 1 : 250. The chromic-acid application, nitrate of silver, carbolic acid, tincture of iodin, quinin solution, perchlorid of mercury, and many of the more powerful caustics and tissue-destroying applications so frequently resorted to in the early history of the treatment of the disorder, I have long ago discarded. These remedies, while sometimes possessing merit, were not lasting, and were frequently more painful than the paroxysms they were supposed to check ; they could only be resorted to in those hopeless cases in which the patient would willingly suffer any pain rather than the distressing hay-fever paroxysms. The stronger solution of iodid of mercury (1 : 250) was so very severe as to often necessitate an hypodermic injection of morphin to control the agony, and in addition it produced an acute catarrh of a severe type lasting several days.

All of the above severe caustic remedies have in turn occasionally proved of value; but my experience of late years has led me to avoid all powerful applications. For the last ten years I have generally used the following solution :

R. Sodium bicarbonate,	
Sodium borate, of each,	℥ iss
Carbolic acid,	℥ j
Glycerin,	℥ ij
Rose-water (25 per cent.),	q. s. Oj.

SIG.—Teaspoonful to one ounce of warm water.

This I thoroughly use in both nostrils, first by means of a hand-ball atomizer; after which, with a curved aluminum applicator or Harrison Allen's nasal cotton-carrier, I very carefully swab the whole nasopharynx. *I scrub most carefully and gently every portion of the mucous membrane, being sure to reach between the turbinated bones and all around and over every slight prominence.* I then as carefully dry the membrane with clean cotton, and use freely a mild solution of menthol, eucalyptus, and camphor in albolin, in proportions as follows :

R. Menthol,	gr. x
Oil of eucalyptus,	℥ j
Pulverized camphor,	℥ ss
Albolin,	℥ ij.

I loosely plug the nose for a few minutes to retain the oily application. It is important to sterilize most thoroughly the three sensitive areas of the nose, as we are unable to determine whether one or more may be affected, and by this mild yet thorough treatment we cleanse effectually the whole nasal chamber.

This treatment was so extremely simple that for a long time I doubted the real extent of its value, but as so many extreme sufferers have expressed their great relief, and were willing and anxious for me to continue the applications, I have concluded to offer my methods in full confidence of their reliability, with a warning that for successful treatment the instructions for cleansing and scrubbing must be followed in the strictest detail. Good results need not be expected by simple irrigation and swabbing—the whole nasal mucous membrane must be thoroughly washed and gently scrubbed before the oily applications are used.

I have found many persons who will not tolerate the use of carbolic acid, even in so mild a solution as that given above, the weakest solution frequently causing a severe urticaria or a painful rhinitis.

When various idiosyncrasies to carbolic acid forbid its use, I select as the second best detergent hydrogen dioxid, and commence with the following mixture :

R. Hydrogen dioxid,
Glycerin,
Distilled water, of each, ℥ij.

With this I spray the nose most thoroughly, following it up with plain warm sterile water to remove the accumulation of foam that will necessarily collect in the nasal spaces. A few days prior to the date of the onset, I increase the strength of the hydrogen dioxid solution, using something like the following :

R. Hydrogen dioxid, ℥iv
Glycerin,
Distilled water, of each, ℥ij.

This must be removed also by means of the sterile water, as already mentioned. In a number of cases I have found glycerin objectionable as a vehicle, producing an irritation of much annoyance. In such cases I omit the glycerin and substitute so much more distilled water. In a few cases the hydrogen dioxid produced an inflammation of the mucous membrane that would require its

dilution. We find so many personal idiosyncrasies in a large number of hay-fever sufferers that one might go on indefinitely with modifications of treatment, but, as in general practice, it is our aim as successful physicians to treat the individual primarily, and we can not dogmatically hold fast to any special drugs.

In the few obstinate cases, in which sterilization seems to provoke additional trouble, and the slightest manipulations of the nose and throat precipitate violent paroxysms, I use on the nasal mucous membrane the following powder :

R.	Morphin. sulph.,	gr. iv
	Boracic acid,	ʒj
	Powdered camphor,	ʒss
	Powdered starch,	ʒiv.

SIG.—To be used as a snuff frequently.

If patients object to the use of the snuff, and occasionally we will find some who will do so for cosmetic reasons, I prescribe the following, to be taken internally :

R.	Tinct. of deod. opium,	ʒiiss
	Spirits of chloroform,	ʒij
	Aromatic elixir, q. s.	ʒij.

SIG.—A teaspoonful in water every four hours for the first two days. (Not to be renewed.)

Some physicians claim that relief can not be afforded to hay-fever patients without using **cocain** or **eucaïn** at some time during the management of troublesome cases. It is very exceptionally that I resort to either; possibly an unusual case will require one or more applications to control a local storm, yet the majority of patients never receive any cocain from my hand.

In several severe cases that came to my notice after the disease had been well established, when I had no chance to conduct a preliminary course of sterilization, I have been forced to prescribe something like the following:

Menthol,	gr. viij
Boric acid,	gr. xxx
Albolin,	℥ij
Solution of Eucaïn "B" (4 per cent.),	℥ij.

This is applied carefully and thoroughly on cotton applicators to the mucous membrane of the nasopharynx. It may control the attacks, and it frequently aborts them and keeps the patient decidedly comfortable. I have found the direct application of the remedy more satisfactory than the atomizer. In some cases, for a few days this application must be made two or three times daily.

H. L. Swain recommends the local use of the aqueous extract of the suprarenal glands in certain chronic conditions of the hay-fever type, as a powerful local vasoconstrictor and contractor of erectile tissue. The local effect can apparently be obtained any number of times without entailing a vicious habit, such as might result from cocain. Ingals and Ohls report that they have obtained much relief in these cases by the use of an extract of suprarenal capsule prepared as follows: Adrenals (Armour's), ℥j; boric acid, gr. xvj; cinnamon water, ℥iv; hot camphor water, ℥j; hot distilled water, enough to make ℥ij. Mix, macerate for four hours, and filter. This solution remains stable for several weeks. It is used as a spray four or five times a day. I have not had occasion to resort to the local application of this substance, but I have had one patient who was distinctly benefited by internal administration in doses of gr. $\frac{1}{4}$ to gr. j, as often as four times a day. He was a catarrhal young man of neurotic temperament, who came to me during the first week of his attack, and who objected to the usual routine sterilization of the nasopharynx.

Surgical Treatment.—In making an analysis

of the abnormalities of the nasopharynx in hay-fever cases, the personal equation enters so largely that, necessarily, statistics are unreliable. What one observer would consider pathologic, another might overlook or call normal. However, I can safely say that in the great majority of my cases there was a decidedly catarrhal nasopharynx, and that in at least one-half there was deviated septum, hypertrophy of the turbinated regions, or polyp. In some cases a combination of all existed. In about ten per cent. of my cases I was satisfied to pronounce the anatomic conformation and the state of the mucous membrane as practically normal.

It has been my experience that only when gross lesions exist is surgical treatment indicated, and then it should precede the usual sterilization methods. Indeed, so frequently successful has been the thorough cleansing of the nares, that in many cases of gross hypertrophy I have neglected removal. If, however, the sterilizing and cleansing treatment did not bring relief, I would resort to the galvanocautery or needle for hypertrophy, or the snare for polypi, after which my nasal cleansing process would be satisfactorily con-

tinued. In cases of deviated septum I rarely felt the necessity for correction, but most carefully followed out the thorough cleansing, unless the case presented itself some months before the expected paroxysm, when correction could be made safely.

A large percentage of my patients during the last five years, anticipating the periods of recurrence, have willingly presented themselves for an annual course of preliminary local treatment. This is extremely necessary to successfully destroy the nerve-habit and to effect a cure.

General Prophylactic, Hygienic, and Systemic Treatment.—In old cases, when the nerve-habit has long been formed, treatment should commence at least two or, better, three weeks before the anticipated recurrence of the paroxysms. All bodily irregularities must be corrected and tendencies to constipation or dyspepsia removed. Amylaceous indigestion should be corrected by the exclusion from the dietary of too starchy foods. For the elimination of excessive uric acid, or other waste products, and to relieve constipation, the systematic administration, morning and night, of effervescent sodium phosphate is invaluable. If the appetite is not good, the regu-

lar use of the tincture of nux vomica, ten to twenty drops three times a day, is strongly indicated. In anemic cases pills of carbonate of iron or, probably still better, the pills of valerianate of quinin, iron, and zinc are necessary. In nervous cases with anemia, valerianate of zinc, one grain with two grains of the compound asafetida pill, two or three times a day (after Morell Mackenzie), will be found valuable. Careful diet, a tranquil mind, and moderate exercise are essential. Outdoor exercise, with a daily tepid bath followed by vigorous friction of the whole body, will help to eliminate waste material. The patient should not unnecessarily expose himself to direct rays of the sun, as they are calculated to excite intense reflex irritation of the sensitive nerve centers. Much trouble may be averted by the use of a sunshade or umbrella and by the avoidance of exercise in the sun.

It must be understood that with the general hygienic and constitutional treatment the course of local prophylaxis by daily sterilization is most necessary.

The treatment of neurasthenic cases, or those in which a decided derangement of the gen-

eral system as well as of the nervous energy exists prior to the attack, requires the greatest tact and skill. If there is little local catarrhal disturbance there will be great difficulty in combating the disease in the face of the depressed vitality and lessened nervous resistance. In such cases I place the patients upon a diet, somewhat like that in the appended list, and urge strict adherence to it. After obtaining careful urinary analysis and other clinical data, I often further specialize in the diet, or I may increase the variety according to the needs of the individual. In these cases I always urge the drinking of large quantities of water, unless there is some strong contraindication. Neurasthenics will often avoid water between meals. I at once order systematic massage. If the patient does not care for a masseur, I order a daily tepid bath of a temperature between 80° and 85° F., with a coarse towel rubbing, followed by a douche of cold water along the spine. This should be continued for at least two weeks prior to the onset of the paroxysms.

Rest for the overtaxed function is imperatively demanded. Unfortunately, this is easier prescribed than carried out. In wealthy patients the Weir

Mitchell rest-cure often gives brilliant results. In other cases a change of scene and a temporary rest from business or society may be accepted when the sanitarium would be out of the question. Quiet resorts on the seacoast or in the mountains are desirable. Nothing is better than two or three weeks on the ocean. A compromise may be obtained by having the patient give up a portion of the daily duties and go to bed earlier at night. The patients should not be allowed to discuss their ailments too freely. Horseback riding, bicycling, rowing, and walking—in fact, any outdoor diversion not too violent—are to be recommended.

If the patient suffers from insomnia, careful administration of a hypnotic may help to reestablish the sleep-habit. At first give a warm bath, and a glass of warm milk or malted milk before retiring. If this and other similar measures do not avail, ten grains of trional powder may be given two hours before going to bed. If the patient is accustomed to wake after a short sleep, the trional should be given at bedtime. Full amounts of sleep are necessary to neurasthenics. Depressants, such as the bromids, chloral, and the opiates should be avoided. Any coexistent gastric or cardiac trouble

must be carefully treated, and the bowels kept open regularly.

The diet that I find most desirable to follow, generally speaking, is that which is applicable to the gouty or uric acid diathesis.

General Rules.—The diet should be liberal, but not stimulating, with moderation in animal foods, and very little of foods having a tendency to produce acids in the system, such as starches, sugars, fats, and fermented liquors. Patients may take soups—clear or vegetable—and weak beef-tea or broths.

Fish.—Fresh fish and raw oysters.

Meats.—To be taken once a day only—mutton, chicken, underdone roast, sweetbread.

Eggs.—Moderation. White of eggs, raw, or shirred in drinks, such as lemonade, occasionally.

Farinaceous.—In small quantities. Toast, stale bread, bread from whole wheat, rye bread, milk-toast, rice, crackers.

Vegetables.—Fresh, green varieties preferable; celery, lettuce, watercress, cucumbers, onions, cabbage, salads, sparingly of baked potatoes, young peas, string beans, and spinach.

Desserts.—Oranges, lemons, apples, apricots,

pears, peaches, cherries, blanc mange (not after meals, however), stewed fruit.

Beverages.—Water, plentifully, especially before meals; plain soda, milk, buttermilk, weak tea or coffee (without sugar), toast-water, lemonade. Mineral waters, such as Saratoga Vichy, Berkley (Hot Springs), Lithia Water, Carlsbad, and Crab Orchard.

Stimulants.—Light Hock; Bordeaux in small quantities and well diluted.

Articles Forbidden.—Patients must avoid rich soups, hard-boiled eggs, fried and made dishes of all kinds, entrées, pickles, spices, veal, pork, duck, goose, salmon, lobster, crab; preserved, dried, and salted meats; salt fish, pickled pork, asparagus, old peas, beans, tomatoes, mushrooms, truffles, dried fruit, preserves, pies, pastry, rich puddings, patties, new bread, cheese, sweets, malts, sweet wines, strawberries, rhubarb, cider, fermented drinks, beer.

Asthma.—About five to ten per cent. of my whole number of hay-fever patients have suffered more or less from asthma. Asthma, as a sequel in these cases, manifests itself about the end of one week or ten days after the expected paroxysms of hay-fever, and is induced usually by some undue exposure or

a damp or rainy day. My asthmatic patients, I find, were among those irregular in treatment, or those who had first called late in the disease. In these cases much mucus had accumulated in the larger tubes. If I can not clear the bronchial tubes by an emetic dose of ipecac, I prescribe somewhat, as follows:

Potassium iodid,	ʒ ss
Ammonium muriate,	ʒ ss
Syrup of Yerba Santa,	ʒj.

A teaspoonful exhibited every two hours generally brings relief. A number of asthmatic patients require a solution of nitroglycerin, one per cent. Of this, one drop every three hours for two or three days is given. Occasionally it seems imperative to give morphin. Some of my asthmatics have informed me that they can bring about immediate relief by plunging both hands in hot water and taking a drink of whisky, followed by a large draft of hot water. It is possible for some persons to voluntarily combat their asthmatic attacks, and for this reason they should be encouraged to practise certain breathing exercises until they can in a measure control their respiratory apparatus. Asthmatics usually have, however, a preexistent

catarrhal state of the bronchial tubes, which exhibit marked vasomotor changes on slight irritation. If I see these patients early, I prescribe five-minim capsules of the oil of sandalwood four times a day, and by the time their period arrives, the bronchitis is fairly well cleared up.

The inhalation of the fumes of burning niter-paper or specially prepared powders, or of cigarettes, gives relief in many cases. The powders used at the Brompton Hospital by Sydney Martin contain one part each of anise and niter, two parts of stramonium leaves, and five grains of tobacco to the ounce; one teaspoonful is to be burnt on a plate and the fumes inhaled. A pill containing $\frac{1}{4}$ of a grain of morphin, with $\frac{1}{120}$ of a grain of atropin sulphate, given at bedtime, is sometimes useful in connection with the inhalations. Extract of stramonium ($\frac{1}{16}$ of a grain) may be substituted for the atropin.

S. Solis-Cohen has used successfully the following formula :

R.	Morphin sulph.,	gr. $\frac{1}{8}$ - $\frac{1}{4}$	
	Strychnin sulph.,	gr. $\frac{1}{60}$ - $\frac{1}{40}$	
	Hyoscin hydrobrom.,	gr. $\frac{1}{200}$	M.

SIG.—Give hypodermically at bedtime.

The following may be administered at night :

R.	Camphor,	gr. ss
	Dover's powder,	gr. vj
	Sugar of milk,	gr. x.

Make four powders.

SIG.—Take one on retiring.

Van Sweringen calls attention to a line of treatment in a very obstinate case of bronchial asthma that was attended by remarkable results. The attack had lasted for two weeks, during which time all the antispasmodics had in turn been exhausted, and the patient had secured but a period of two hours' freedom at any one time. Finally, based on the theory that if asthma was reflex it must be under the control of Setschenow's inhibitory center, and that anything that would stimulate the inhibitory center would lessen the reflex-spasm, quinin and strychnin were given, with excellent results. The dose of the quinin was seven grains. The extract of nux vomica was given in $\frac{3}{4}$ -grain doses, and to this was added $\frac{1}{4}$ of a grain of codein sulphate. In the interval the iodids were continued.

However, the use of sedatives and inhalations must be limited, especially in the milder and un-

complicated forms of asthma, while efforts to benefit the patient's general condition are strongly indicated. Diet is an important part of the treatment of many cases. Not all cases of asthma are due to uricacidemia, but nearly all cases are benefited by attention to the diet and elimination of excess uric acid.

Of remedies that may be continuously administered to patients who have frequently recurring attacks, two are most constantly used—namely, iodid of potassium and arsenic. The iodid may be most conveniently given with stramonium, as in the mixture devised by Martin, which consists of $\frac{1}{4}$ of a grain of extract of stramonium, two grains of extract of licorice, three grains of iodid of potassium, and five minims of chloric ether. This mixture may be given two or three times daily in cases of asthma. It possesses two disadvantages, however. The stramonium leads, in some cases, to paralysis of accommodation, but by diminishing the dose, the patient soon ceases to experience discomfort from the remedy. If given alone, the iodid must be administered in five-grain doses two or three times daily, the medicine being discontinued from time to time. Arsenic by itself, in doses of

three minims of the liquor arsenicalis, is a useful remedy for continuous administration in asthma, and it may be combined with potassium iodid (three to five grains) in a mixture. Hydrotherapeutic treatment is of use in some cases of asthma. The patient should be accustomed to gradually colder baths of short duration with douches.

BIBLIOGRAPHY.

1565.

Botallus (L.), Comment. duo, alter de Medici, alter de
Ægroti Unnere, Lugduni, 1565, p. 23.

1673.

Binningerus (J. N.), Obs. et Curat. Med. Cent. quinquæ,
Cent. secundo, Obs. lxxxvi, 1673.

1698.

Floyer (John), London, 1698, On Asthma.

1707.

Van Helmont (J. B.), Asthma et Tussis, cap. x, Opera
omnia, p. 344. Hafniæ, 1707.

1712.

Acta nat. curios. Ephemerides, 1712-17, Dec. III, An. v and
vi, obs. 193.

1819.

Bostock (J.), Case of a Periodical Affection of the Eyes
and Chest. Med.-Chir. Tr., Lond., 1819, x, 161-165.

1824.

Schweigger-Seidel (F. G.), De febrium Æstivalium origine
atque natura, 8. Halæ, 1824.

1828.

Schuler (J. B.), Das Sommerfieber am Mittelrhein im Jahre
1827. Jahrb. d. Phil.-Med. Gesellsch. zu Würzb., 1828, i,
2. Heft, 61-72.

Bostock (J.), Of Catarrhus Æstivus. Med.-Chir. Tr., Lond., 1828, xiv, 437-446.

1829.

Gordon (W.), Observations on the Nature, Cause, and Treatment of Hay-asthma. Lond. M. Gaz., 1829, iv, 266-269.

1830.

Elliotson, Lancet, Lond., 1830-31, ii, 370-373.

1831.

Elliotson, Hay-fever; Information Solicited. Lond. M. Gaz., 1831, viii, 411-416.

Prater (A.), Lancet, Lond., 1831, ii, 445.

1833.

Elliotson, Catarrhus Æstivus, or Hay-fever. Med. Gaz., Lond., 1833, xii, 164-171.

Also, Boston M. and S. J., 1833, vii, 341-347.

1838.

Schwandner (W. F.), Casus asthmatis thymici cum pneumonia conjuncti, 8. Tubingæ, 1838.

1842.

Scott (R. W.), On Bronchorrhœa Æstiva, or Hay-fever. Prov. M. and S. J., Lond., 1842, iv, 123.

Cheyne (R. R.), Lond. M. Gaz., 1842-43, xxxi, 329.

1843.

King (T. W.), On Summer Asthma. Lond. M. Gaz., 1843, xxxii, 671-675.

1846.

Swett, Hay-asthma, N. York M. J., 1846, vi, 10.

1850.

Gream (G. T.), On the Use of Nux Vomica, as a Remedy in Hay-fever. Lancet, Lond., 1850, i, 629.

1851.

Mackenzie (F. W.), Remarks on the Nature and Treatment of Hay-fever. Lond. J. M., 1851, iii, 637-643.

1852.

Kirkman (W. P.), Prov. M. and S. J., Lond., 1852, 360.

1853.

Wey (W. C.), Hay-asthma. Tr. M. Ass. South. Central N. Y., Auburn, 1853, 78-82.

1856.

Kunkler (G. A.), Med. Counsellor, Columbus, 1856, ii, 605.

1857.

Hay-asthma, Boston M. and S. J., 1857, lvi, 316.

Ellis (W. R.), On the Treatment of Hay-fever. Lancet, Lond., 1857, ii, 24.

Palmer (S.), Treatment of Hay-fever. Lancet, Lond., 1857, ii, 127.

1859.

Laforget, Union méd., Par., 1859, 2 s., iv, 550-552.

Phœbus (P.), On Hay-asthma. Lancet, Lond., 1859, ii, 655.

1860.

Catarrhe d'été ou fièvre de foin. Abeille méd., Par., 1860, xviii, 38.

Catarro (Del) di estate, o asma del fieno. Morgagni, Napoli, 1860, iii, 122-128.

Cornaz, De l'existence du catarrhe des foins en Suisse. Réponse au professeur Phœbus. Écho méd., Neuchât., 1860, iv, 307-318.

Laforge, Catarrhe d'été. Gaz. d. Hôp., Par., 1860, xxxiii, 44.

Also, Gaz. hebd. de méd., Par., 1860, vii, 67.

Perey (L.), Contribution à l'étude de l'asthme des foins en Suisse. *Écho méd.*, Neuchât., 1860, iv, 595-598.

Phœbus (P.), Das Heufieber. *Med. Ztg.*, Berl., 1860, n. F., iii, 92.

Phœbus (P.), Circulare relativ à la maladie connue sous les noms de catarrhe, bronchite, ou asthme d'été, et sous ceux de fièvre ou asthme des foins. *Écho méd.*, Neuchât., 1860, iv, 304-307.

1861.

Darrach (J.), Strychnia in Hay-fever and Influenza. *Maryland and Virg. M. J.*, Richmond, 1861, xvi, 106-109.

1862.

Hervier, Trois observations de catarrhe d'été sans fièvre de foin. *Gaz. hebd. de méd.*, Par., 1862, ix, 169.

Phœbus (P.), Der typische Frühsommer-Katarrh, oder das sogenannte Heufieber, Heu-Asthma. 8°. Giessen, 1862.

1863.

Smith (W. A.), Observations on Hay-fever. *Med. Times and Gaz.*, Lond., 1863, N. S., ii, 535.

Windsor (J.), The Cause of Hay-fever. *Med. Times and Gaz.*, Lond., 1863, ii, 681.

1865.

Bird (J.), Hay-fever. *Brit. M. J.*, Lond., 1865, ii, 73.

Herrier, *Ann. Soc. de méd. de St. Étienne et de la Loire*, 1865, ii, 36-39.

Smith (W. A.), *Observations on Hay-fever, Hay-asthma, or Summer Catarrh*. 3d ed. 8vo. Lond., 1865.

Smith (W. A.), *Observations on Hay-fever, Hay-asthma, or Summer Catarrh*. *Med. Mirror*, Lond., 1865, ii, 342-352.

1866.

Price (T. T.), *Autumnal Catarrh, or Hay-asthma*. *Tr. M. Soc. N. Jersey*, Newark, 1866, 162-165.

1867.

- Pirrie (W.), On Hay-asthma. *Med. Times and Gazette*, Lond., 1867, ii, 2, 30.
 Pirrie (W.), On Hay-asthma and the Affection Termed Hay-fever. 8vo. London, 1867.
 Stricker (W.), Heufieber. *Arch. f. path. Anat.*, etc., Berl., 1867, xli, 292.

1868.

- Ferber (R. H.), II. Der typische Frühsommer-Katarrh. *Arch. d. Heilk.*, Leipz., 1868, ix, 556-558.
 Yearsley (J.), The Local Treatment of Hay-fever. *Med. Press and Circ.*, Dublin, 1868, iii, 477.

1869.

- Kernig (W.), *St. Petersb. med. Ztschr.*, 1869, xvii, 17-29.
 Zoja (G.) and De Giovanni (A.), Sopra la febbre del fieno e l'azione del solfato neutro di chinino su alcuni infusori. *Gazz. med. Ital. Lomb.*, Milano, 1869, 6 s., ii, 307.

1870.

- Cooke (A. M.), Hay-fever. *Ecl. M. J.*, Cincin., 1870, xxx, 84.
 Moore (G.), Summer Catarrh, or Hay-fever: Its Causes, Symptoms, and Treatment. 12mo. Lond., 1870.
 Roberts (W. C.), Catarrhus Æstivus. *Med. Gaz.*, N. Y., 1870, v, 225; 1870-71, vi, 15.

1871.

- Ferber (R. H.), Das Helmholtz'sche Verfahren gegen das Heufieber. *Ibid.*, 1871, xii, 555.
 Thompson (E. S.), Notes of a Lecture on Hay-fever. *Brit. M. J.*, Lond., 1871, i, 58-60.

1872.

- Barratt (R.), Hay-fever non-estival. *Med. Times and Gaz.*, Lond., 1872, i, 721.

Guéneau de Mussy (N.), Sur la rhino-bronchite spasmodique ou fièvre de foin. *Gaz. habd. de méd., Par.*, 1872, 2 s., ix, 9, 35.

Also, *Art. méd., Brux.*, 1872, viii, 24, 41, 66, 86.

Also, in his *Clin. méd.*, 8, *Par.*, 1874, i, 519-564.

Herbert (A.), Étude sur la maladie de foin, rhino-bronchite spasmodique. 4°. *Paris*, 1872.

Smith (W. A.), On Hay-fever. *Med. Press and Circ., Lond.*, 1872, xiv, 42.

Villemsens (L.), Étude sur le catarrhe spasmodique d'été, dit catarrhe de foin, rhino-bronchique spasmodique. 4°. *Paris*, 1872.

Waters (A. T. H.), Clinical Remarks on So-called Hay-fever. *Brit. M. J., Lond.*, 1872, i, 4.

Wyman (M.), Autumnal Catarrh, 8vo. *N. Y.*, 1872.

1873.

Blackley (C. H.), Experimental Researches on the Causes and Nature of Catarrhus Æstivus (Hay-fever or Hay-asthma). 8vo. *Lond.*, 1873.

C., The White Mountains and Hay-fever. *Clinic, Cincin.*, 1873, v, 213-215.

Moss (W.), Hypodermic Injection of Sulphate of Morphia, in Autumnal Catarrh. *Am. J. M. Sc., Phila.*, 1873, N. S., lxxv, 275.

1874.

Beard (G. M.), To Those Suffering from Hay-fever. Second circular of inquiry. *Arch. Electrol. and Neurol., N. Y.*, 1874, i, 273-279.

Binz, An Experimental Observation on Hay-fever. *Practitioner, Lond.*, 1874, xii, 269-272.

Bradbury (J. B.), Treatment of Hay-fever. *Brit. M. J., Lond.*, 1874, i, 514.

Brandeis (R. C.), Remarks on Hay-fever, with Cases. *Am. Prac., Louisville*, 1874, x, 24-26.

- Glas (O.), Upsal a Läkaref. Förh., 1874, ix, 98-101.
 Hoover (T. C.), Hay-fever Successfully Treated. Am. J. M. Sc., Phila., 1874, N. S., lxxvii, 379.
 Lühe (F.), Zum Heufieber. Deutsches Arch. f. klin. Med., Leipz., 1874, xiv, 426, 614.

1875.

- Zuelzer (W.), Heufieber. Handb. d. spec. Path. (Ziemssen), Leipz., 1874, ii, 2. Th., 514-526.
 Also, Transl., Cycl. Pract. M. (Ziemssen), N. Y., 1875, ii, 539-552.

1876.

- Baynes (D.), Hay-fever. Pub. Health Mag., Montreal, 1876, i, 353-358.
 Beard (G. M.), Hay-fever, or Summer Catarrh: Its Nature and Treatment. Including the early form, or "rose cold"; the later form, or "autumnal catarrh," and a middle form, or "July cold," hitherto undescribed. 12mo. N. Y., 1876.
 Beard (G.), New Facts and Suggestions Relating to Hay-fever. Med. Rec., N. Y., 1876, ii, 650-654.
 Segur (B. A.), The Pollen of Rag-weed (*Ambrosia artemisiæfolia*) the Cause of Hay-fever. Proc. M. Soc., County Kings, Brooklyn, 1876, i, 165-167.

1877.

- Beard (G.), The Nerve Theory of Hay-fever. Med. Times and Gaz., Lond., 1877, ii, 385.
 Beard (G.), The Successful Treatment of Hay-fever. Med. Rec., N. Y., 1877, xii, 509.
 Bell (J. E.), Hay-fever. Med. and Surg. Reporter, Phila., 1877, xxxvii, 461-465.
 Blackley (C. H.), Bemerkungen über Dr. G. J. Patton's Experimente über Heufieber. Arch. f. path. Anat., etc., Berlin, 1877, lxx, 429-443.

- Also, trans. Abstr. Med. Times and Gaz., Lond., 1877, ii, 243.
- Evans (T. N.), Hay-fever. Virginia M. Month., Richmond, 1877, iv, 167-175.
- Marsh (E. J.), Hay-fever, or Pollen Poisoning. Trans. M. Soc. N. J., Newark, 1877, 86-109.
Also, reprint.
- Patton (G. F.), Einige Erfahrungen über Heufieber. Arch. f. path. Anat., etc., Berl., 1877, lxi, 531-533.
- Wyckoff (R. M.), The Adirondacks and "Hay-fever." Proc. M. Soc. County Kings, Brooklyn, 1877, ii, 172-176.

1878.

- Beard (G.), Peculiar and Unusual Symptoms of Hay-fever. Ibid., 1878, xiv, 348.
- Pfuhl (F.), Berl. klin. Wochenschr., 1878, xv, 772.
- United States (The) Hay-fever Association. Med. and Surg. Reporter, Phila., 1878, xxxix, 360.
- Wey (W. C.), Hay-fever *versus* Paralysis of the Diaphragm. Med. Rec., N. Y., 1878, xiv, 289.
- Wood (W. J. H.), Salicylic Snuff in Hay-fever. Brit. M. J., Lond., 1878, ii, 101.

1879.

- Giffo (P.), Quelques Considérations sur la fièvre des foins, et principalement de la conjonctivite et de l'otite dans cette maladie. Ann. d. mal. de l'oreille et du larynx. Par., 1879, v, 297-299.
- Giffo (P.), Considérations générales sur la fièvre des foins, et particulièrement de la conjonctivite dans cette maladie. Rec. d'ophthal., Par., 1879, 3 s., i, 459-464.
- Yelvington (C. H.), Grindelia robusta and Yerba santa in Hay-fever. New Preparations, Detroit, 1879, iii, 141.
- Hay-fever. Med. Herald, Louisville, 1879-80, i, 248-250.

- Sebastian (C. M.)**, A Novel and Successful Remedy for Hay-fever. *Med. Herald*, Louisville, 1879-80, i, 159.
- Outsider (An)**, Description of Hay-asthma. From *N. York World*. *Gaillard's M. J.*, N. Y., 1880, xxx, 451.
- Also, *Pacific M. and S. J.*, San Fran., 1879-80, xxii, 342.

1880.

- Blackley (C. H.)**, Hay-fever: Its Causes, Treatment, and Effective Prevention. 2d ed. 8vo. Lond., 1880.
- Lindseth (E. B.)**, *Norsk. Mag. f. Lægevidensk.*, Christiana, 1880, x, 464-466.

1881.

- Atkinson (F. P.)**, The Treatment of Hay-fever. *Brit. M. J.*, Lond., 1881, ii, 81.
- Blackley (C. H.)**, On the Treatment and Prevention of Hay-fever. *Lancet*, Lond., 1881, ii, 371.
- Hannay (J. B.)**, Treatment of Hay-fever. *Nature*, Lond., 1881, xxiv, 485.
- Mann (E. C.)**, The Chloro-phosphide of Arsenic in Hay-fever. *Gaillard's Med. Jour.*, N. Y., 1881, xxxii, 9.
- Thorowgood (J. C.)**, Practical Remarks on the Treatment of Summer Catarrh and Hay-asthma. *Lancet*, Lond., 1881, ii, 82.
- Williams (W. M.)**, Hay-fever. *Nature*, Lond., 1881, xxiv, 510.
- Daly (W. H.)**, On the Relation of Hay-asthma and Nasal Catarrh. *Tr. Am. Laryngol. Ass.*, N. Y., 1881, iii, 164-168.
- Also, *Arch. Laryngol.*, N. Y., 1882, iii, 157-161.

1882.

- Townsend (M. M.)**, Hay-fever, Asthma, and Chronic Catarrh. 12mo. Grinnell, 1882.
- Daly (Wm. H.)**, On the Relation of Hay-asthma and Chronic Naso-pharyngeal Catarrh. Monograph, 1882.

1883.

- Boyd (S. S.), Hay-fever. J. Am. M. Ass., Chicago, 1883, i, 631.
- Ferguson (R. M.), Hay-fever. Louisville M. News, 1883, xvi, 241-243.
- Hack (W.), Heufieber. Wien. Med. Wochenschr., 1883, xxxiii, 405-410.
- Phillips (W. F.), The Treatment of Hay-fever. Brit. M. J., Lond., 1883, ii, 69.
- Roe (J. O.), The Pathology and Radical Cure of Hay-fever, or Hay-asthma. N. York M. J., 1883, xxxvii, 509, 540.
Also, Abstr., Med. News, Phila., 1883, xlii, 169.
- Sajous (C. E.), Notes on Hay-fever. Med. and Surg. Reporter, Phila., 1883, xlix, 675-678.
- Sufferer (A), Reply to Correspondent. Brit. M. Jour., 1883, i, 1315.
- Woodbury (Frank), Etiology of Hay-fever. Phila. Med. Times, Dec. 1, 1883, 175.

1884.

- Allen (H.), On the Treatment of Hay-fever and Allied Disorders. Am. J. M. So., Phila., 1884, N. S., lxxxvii, 156-164.
- Mackenzie (J. N.), Coryza Vasomotoria Periodica in the Negro. Med. Rec., Oct. 18, 1884.
- Mackenzie (J. N.), A Contribution to the Study of Coryza Vasomotoria Periodica, or So-called "Hay-fever." Med. Rec., N. Y., 1884, xxvi, 59-63.
- Paget (W. D.), A Few Remarks on Hay-fever. Brit. M. J., Lond., 1884, i, 1203.
- Pruritic Rhinitis (discussion). St. Louis M. and S. J., 1884, xlvii, 48, 55.
- Rumbold (T. F.), Pruritus Rhinitis Catarrhalis. St. Louis M. and S. J., 1884, ix, 449.

- Rumbold (T. F.), Rhinitis Pruritus, or Itching Nasal Catarrh. Weekly M. Rev., St. Louis, 1884, iv, 409, 426.
- Sajous (C. E.), Hay-fever and Its Successful Treatment. N. Y. Med. J., 1884, xl, 629-633. Tr. Am. Laryngolog. Ass., N. Y., 1884, vi, 106-116.
- Seiler (C.), Hay-fever and Its Treatment. Rep. Alumni Ass., Phila. Coll. Pharm., 1884-85, xxi, 75-86.

1885.

- Ayres (S. C.), Cocaine in Hay-fever. Cincin. Lancet and Clinic, 1885, N. S., xv, 317.
- Bartholow (Roberts), Note on the Use of Cocaine in Hay-fever. Phila., 1885, 5 I, 8vo.
- Cheatham (W.), Is There a Cure for Hay-fever? Louisville M. News, 1885, xx, 113-116.
- Ingals (E. F.), Hay-fever: Its Cause and Cure. M. J. and Exam., 1885, li, 1161-1163.
- Mackenzie (J. N.), Observations on the Origin and Cure of the Disease Called "Hay-asthma." Tr. M. and Clin. Fac., Maryland, Balt., 1885, 216-221.
- Mackenzie (J. N.), Observations on the Origin and Cure of the Disease Called "Hay-asthma." Maryland Med. J., Balt., 1885, xiii, 74.
- Mackenzie (J. N.), Review. Hay-fever: Its Etiology and Treatment. By M. Mackenzie. Am. J. M. Sc., Phila., 1885.
- Mackenzie (Morell), Hay-fever: Its Etiology and Treatment. 3d ed., Lond., 1885, 54 pp., 8vo; 4th ed., Lond., 1887, 96 pp., 8vo.
- Robinson (B.), Note on the Therapeutics of Hay-fever (so-called). Med. Rec., N. Y., 1885, xxviii, 425.
- Sajous (Chas. E.), Hay-fever and Its Successful Treatment by Superficial Organic Alteration of the Nasal Mucous Membrane. Phila., 1885, F. A. Davis, 103 pp., 12mo.

- Stucky (J. A.)**, Pruritic Catarrh, or Hay-fever: Its Treatment. St. Louis M. and S. J., xlviii, 466-475.
- Thomas (R. H.)**, Report of a Case of So-called Hay-fever Treated by Galvano-Cautery. Med. News, Phila., 1885, xlv, 228-230.
- Watson (J.)**, Cocaine in Hay-fever. Med. Bull., Phila., 1885, vii, 268-270.
- Ziem**, Ueber Rosenschnupfen. Monatschr. f. Ohrenh., Berl., 1885, xix, 167.
- Beschomer**, Ueber Heufieber und dessen Behandlung. Jahresb. d. Gesellsch. f. Nat. u. Heilk. in Dresd., 1885-86, 3-4^o.
- Holmes (E. W.)**, Cocaine in the Treatment of Hay-fever. Phila. Med. Times, 1885-86, xvi, 561.
- Muckey (F. P.)**, Hay-fever. Northwest Lancet, St. Paul, 1885-86, v, 341-346.

1886.

- Bishop (S. S.)**, Cocaine in Hay-fever. J. Am. M. Ass., Chicago, 1886, vi, 141-144.
- Blum (J.)**, Periodical Hyperesthetic Rhinitis. Maryland M. J., Balt., 1886, xv, 121-124.
- Bosworth (F. H.)**, Hay-fever, Asthma, and Allied Affections. N. Y. M. J., 1886, xliii, 462, 488.
- Da Costa (J. M.)**, Remarks on the Treatment of Rose-cold and Hay-fever by Cocaine. Tr. Coll. Phys., Phila., 1886, 3 s., viii, 197-203.
- Hack**, Ueber Catarrhus Autumnalis und Heufieber. Deutsche med. Wochenschr., Berl., 1886, xii, 141-144.
- Lindley (W.)**, Hay-fever in Southern California. South. Cal. Practitioner, Los Angeles, 1886, i, 263-267.
- Logan (J. E.)**, A Few Cases of Hay-fever and Its Complications. Kansas City Med. Rec., 1886, iii, 327.
- Mackenzie (J. N.)**, The Production of the So-called "Rose Cold" by Means of Artificial Rose, with Remarks and

- Historical Notes. *Am. J. M. Sc.*, Phila., 1886, N. S., xci, 45-57.
- Mulhall (J. C.), Recent Progress in the Treatment of Hay-fever. *St. Louis Coun. Med.*, 1886, xv, 97-103.
- Robinson (B.), A Contribution to the Study of Hay-fever (so-called). *Med. News*, Phila., 1886, xlix, 59-62.
- Rumbold (T. F.), The Special Hygiene of Asthmatics, and Those Suffering from Pruritic Rhinitis. *Am. Pract. and News*, Louisville, 1886, N. S., ii, 388-391.

1887.

- Bishop (S. S.), Hay-fever. *J. Am. M. Ass.*, Chicago, 1887, ix, 103-107.
- Bishop (S. S.), Hay-fever. First Prize Essay of U. S. Hay-fever Association for 1887. Repr. from *J. Am. M. Asso.*, 1887.
- Bishop (S. S.), Pathology of Hay-fever. *Tr. Inter. M. Cong.*, IX, Wash., 1887, v, 52-78.
- Butterfield (S. A.), Hay-fever. *Med. Reg.*, Phila., 1887, i, 402.
- Clark (Sir A.), The Cavendish Lecture on a Speedy and Sometimes Successful Method of Treating Hay-fever. *Lancet*, Lond., 1887, i, 1169-1171; *Brit. M. J.*, Lond., 1887, i, 1255-1257.
- Klingensmith (J. P.), Hay-asthma. Greensburg, Pa., 1887. 8 pp., 12mo. *Tr. Inter. M. Cong.*, Wash., IX, 1887, iv, 60-67.
- Roe (J. O.), Hay-fever. Analysis of 42 cases. *N. York M. J.*, 1887, xlvi, 255-259.
- Rumbold (T. F.), Surgical Methods for the Relief of Pruritic Rhinitis. *J. Am. M. Ass.*, Chicago, 1887, viii, 5-8.
- Thomas (R. H.), A Contribution on the Causes and Treatment of So-called Hay-fever and Allied Affections. *Tr. Internat. M. Cong.*, IX, Wash., 1887, iv, 7-11.

- United States Hay-fever Asso. Manual of the Asso. for 1887. Lowell, 1887, S. W. Huse & Co., 40 pp., 12mo.
 Capp (W. M.), Hay-fever, with Some Notes on Palliative Treatment. Phila. M. Times, 1887-88, xviii, 196-199.

1888.

- Bishop (S. S.), The Pathology of Hay-fever. J. Am. M. Ass., Chicago, 1888, x, 317-320.
 Genth (C.), Therapeutics of Hay-fever. Brit. M. J., Lond., 1888, i, 1268.
 Kinnear (B. O.), Hay-fever as a Disease of Central Nervous Origin, etc. Med. Rec., N. Y., 1888, xxxiv, 32-36.
 Kitchen (J. M. W.), A Contribution to the Study of Hay-Fever. Med. Rec., N. Y., 1888, 628.
 Lermoyez, Sur la pathogénie de l'asthme de foin. Ann. de mal. de l'oreille, du larynx, etc. Par., 1888, xiv, 140-150.
 Lippincott (E.), Hay-fever, or Rhinitis Vasomotoria Periodica, and Its Radical Cure. Chicago, 1888, Gross & Dellridge, 78 pp., 12mo.
 Lockwood (S.), The Pathology of Pollen in *Æstivus*, or Hay-fever. J. N. York Micr. Soc., 1888, iv, 99-105, 1 pl.
 McBride (P.), On Hay-fever and Allied Conditions. Brit. M. J., Lond., 1888, ii, 605-608.
 Natier (Marcel), Fièvre des foins: pathogénie et traitement. Par., 1888, 159 pp., 4to. No. 76.
 U. S. Hay-fever Association. Manual for 1888. Phila., Pa., 1888, R. E. Lynch, 52 pp., 16mo.
 Windle (B. C. A.), A Personal Experience of Hay-fever. Birmingham. Med. Rev., 1888, xxiv, 259-265.

1889.

- Bronner (A.), Pseudo-Hay-fever: Symptoms and Treatment. Lancet, Lond., 1889, ii, 66.
 Bronner (A.), Pseudo-Hay-fever. Brit. M. J., Lond., 1889, i, 656.

- Hall (F. de H.), Hay-fever and Hay-asthma. *Lancet*, Lond., 1889, i, 1183.
- Husted (N. C.), Hay-fever: Its Treatment Physiologically and Pathologically Considered. *J. N. York Micr. Soc.*, 1889, v, 26-31, 1 pl.
- L. (A. H.), The Radical Cure of Hay-fever with Chromic Acid. *Med. News*, Phila., 1889, iv, 417.
- Mackenzie (Morell), Hay-fever and Paroxysmal Sneezing: Their Etiology and Treatment, with Appendix on Rose cold. 5th ed. Lond., 1889, 100 pp., 1 pl., 8vo.
- Rumbold (T. F.), Remarks Upon Pruritic Rhinitis (Hay-fever), and a Synopsis of Treatment. *Tr. M. Ass. Missouri*, St. Louis, 1889, 60-65.
- Taylor (J. J.), Hay-fever. *Memphis M. Month.*, 1889, ix, 486-489.
- Thornton (T. R.), Hay-fever. *Kansas City Med. Index*, 1889, x, 319-323.

1890.

- Aulde (J.), Treatment of Hay-fever. *Med. and Surg. Reporter*, Phila., 1890, lxiii, 153-156.
- Berkart (J. B.), The Pathology of Hay-fever. *Lancet*, Lond., 1890, ii, 12, 69.
- Hurt (W. J.), Etiology and Treatment of Hay-fever. *Indiana M. J.*, Indianap., 1890, i, ix, 219.
- Rixa (A.), Contribution to the Therapeutics of Hay-fever. *Therap. Gaz.*, Detroit, 1890, 3 s., vi, 311-313.

1891.

- Bullock (J. E.), Hay-fever and Excessive Sneezing. *Prov. M. J.*, Leicester, 1891, x, 324-327.
- Gluck (I.), The Treatment of an Attack of Hay-fever. *Med. Rec.*, N. Y., 1891, xxxix, 564-566.
- Leal (M.), Some Observations on Hay-fever. *J. Ophth., Otol., and Laryngol.*, N. Y., 1891, iii, 334-339.

- Loebinger (H. J.), Terpine Hydrate in the Asthmatic Stage of Hay-fever. *N. York M. J.*, 1891, liv, 657.
- Rixa (A.), Further Contribution to the Therapeutics of Hay-fever. *Therap. Gaz.*, Detroit, 1891, 3 s., vii, 811.
- United States Hay-fever Association. Manual for 1891. Scientific Essays, etc. 1891, 76 pp., 8vo.
- Perkins (C. E.), Some Points on the Pathology and Treatment of Hay-fever. *Cleveland M. Gaz.*, 1891-2, vii, 267-273.

1892.

- Kyle (D. B.), The Treatment of Hay-fever by Means of Cocaine Phenate. *Med. News, Phila.*, 1892, lxi, 676.
- Szohner (J.), Contribution to Etiology and Treatment of Hay-fever. *Trans. Pest. Med.-Chir. Presse, Budapest*, 1892, xxviii, 371.
- Taylor (J. I.), Hay-fever and Its Treatment. *Memphis M. Month.*, 1892, xii, 7-11.
- Tyrrell (R. S.), A Predisposing Cause of Hay-fever. *Canad. Pract.*, Toronto, 1892, xvii, 344-346.
- U. S. Hay-fever Asso. Manual for 1892. Scientific Essays, etc. 66 pp., 16mo.
- Williams (P. W.), Hay-fever and Hay-asthma. *Bristol M.-Chir. J.*, 1892, x, 84-96.
- Macdonald (G.), A Clinical Lecture on Hay-fever and Asthma. *Clin. J.*, Lond., 1892-3, i, 390-396.

1893.

- Bishop (S. S.), A New Pathology and Treatment of Nervous Catarrh. *J. Am. M. Ass.*, Chicago, 1893, xxi, 809-813.
- Treatment (The) of Hay-fever. *J. Am. M. Ass.*, Chicago, 1893, xxi, 798-803. (Discussion.)

1894.

- Bishop (S. S.), A New and Successful Treatment of Hay-fever. The Views of the Profession. *Med. News, Phila.*, 1894, lxiv, 197-201.

- Wilson (J. C.),** Hay-fever. American Text-book of the Theory and Practice of Medicine (Pepper), 1894, ii, 452.
- Wolfe (A. C.),** Treatment of Hay-fever. J. Am. M. Asso., Chicago, 1894, xxiii, 457-459.
- Wolfe (A. C.),** Hay-fever. Columbus M. J., 1894-5, xiii, 387-397.

1895.

- Aulde (J.),** Autumnal Catarrh and Its Rational Treatment. Alkaloid Clinic, Chicago, 1895, ii, 171-173.
- Bicycling in Hay-fever. Med. Rec., N. Y., 1895, xlvi, 142.
- Brunson (R.),** Operative Interference in Hay-fever. Hot Springs M. J., 1895, iv, 129-131.
- Capp (W. M.),** About Local Treatment in Hay-fever. Phila. Polyclin., 1895, iv, 417.
- Cohen (S. S.),** A Case of Hay-fever. Internat. Clinic, Phila., 1895, 5 s., iii, 81-86.
- Prince (M.),** Hay-fever, Due to Nervous Influences, Occurring in Five Members of Same Family. Am. Gynæc. and Pædiat., Boston, 1895, viii, 638-642.
- Smith (F. G.),** Palliative Treatment of Hay-fever. Med. Rec., N. Y., 1895, xlvi, 484.
- Treatment of Hay-fever. Kansas M. J., Topeka, 1895, vii, 496.
- Grayson (C. P.),** The Neurotic Habit as a Causative Factor of Hay-fever. Univ. M. Mag., Phila., 1895-6, viii, 789-793.

1896.

- Abercrombie (P. H.),** Valerianate of Zinc in Hay-fever. Brit. M. J., Lond., 1896, i, 967.
- Amos (A. R.),** Recent Views of the Causation of Asthma, Hay-fever, and Allied Affections, and Their Treatment. Tri-State Med. J., St. Louis, 1896, iii, 405-410.
- Arnold (H. A.),** Hay-fever and Its Complications. Med. and Surg. Reporter, Phila., 1896, lxxv, 528-530.

- Bishop (L. F.), Hay-fever and Its Successful Treatment. Laryngoscope, St. Louis, 1896, i, 21-28.
- Bulette (W. W.), Treatment of Hay-fever. Med. Fortnightly, St. Louis, 1896, x, 476-481.
- Bulette (W. W.), Treatment of Hay-fever. Tr. Colorado M. Soc., Denver, 1896, 88-97.
- Cheatham (W.), Hay-fever; The Best Treatment for Stay-at-homes. Laryngoscope, St. Louis, 1896, i, 225-228.
- Hunsberger (J. N.), Hay-asthma. Med. and Surg. Reporter, Phila., 1896, lxxv, 777.
- McCassy (J. A. S.), Hay-fever. Med. Progress, Louisville, 1896, xii, 380-382.
- Sticker (G.), Der Bostock'sche Sommerkatarrh. Spec. Path. u. Therap., Nothnagel, Wien, 1896, iv, 2. H. 2. Abth. 85-145.
- Strangways (W. F.), Hay-fever: A Successful Treatment Founded on a New Theory. Phys. and Surg., Detroit and Ann Arbor, 1896, xviii, 1-8.
- Sufferer (A.), Periodic Autumnal Catarrh: Hay-fever. Med. Age, Detroit, 1896, ii, 513-526.
- Wilson (N. L.), Uric Acid as a Factor in the Production of Hay-fever. N. York M. J., 1896, lxiv, 836-839.

1897.

- Abbotts (W.), On Hay-fever, Hay-asthma, or Summer Catarrh. Lond., 1897, Butler & Tanner, 82 pp., 12mo.
- Capp (W. M.), A Contribution to the Symptomatology of Hay-fever. Med. News, N. Y., 1897, lxii, 520.
- Elias (J. P.), Bostock's Zomerkatarrh. Med. Weekbl., Amst., 1897-8, iv, 133-138, 149.
- Goenner (A.), Ueber Heufieber. Cor.-Bl. f. schweiz. Aerzte, Basel, 1897, xxvii, 233-241.
- Grayson (C. P.), The Rational Treatment of the Constitutional Factor in the Causation of Hay-fever. Therap. Gaz., Detroit, 1897, 3 s., xiii, 653-655.

- Holmes (Edmund W.), Hay-fever. *Med. and Surg. Rep.*, 1897, xxvii, 513.
- Ingals (E. F.), Hay-fever. *Twentieth Century Practice of Medicine*, ii, 183.
- Lewis (F. D.), Hay-fever. *J. Oph., Otol., and Laryngol.*, N. Y., 1897, ix, 327-332.
- Mason (A. L.), Hay-fever. *Syst. Prac. M. (Loomis)*, N. Y. and Phila., 1897, ii, 178-185.
- Müller (J.), Ueber Heufieber. *Wien. med. Presse*, 1897, 1632.
- Strangways (W. F.), Hay-fever. *Laryngoscope*, St. Louis, 1897, ii, 213; *Phys. and Surg.*, Detroit and Ann Arbor, 1897, xix, 270.

1898.

- Cheatham (W.), This Year's Experience with the Treatment of Hay-fever for Stay-at-homes. *Louisville Med. Monthly*, 1898-9, iv, 286.
- Clark (C. E.), A Plea for Radical Treatment of Hay-fever. *Kansas City Med. Index*, 1898, xix, 37-40.
- Goodhart (J. F.), On Asthma and Hay-fever. *Syst. Medicine (Allbutt)*, N. Y. and Lond., 1898, v, 286-310.
- Hollopeter (W. C.), Hay-fever and Its Successful Treatment. 8vo, P. Blakiston's Son & Co., Philadelphia, 1898.
- Weaver (W. H.), Hay-fever. *Journal Am. Med. Assoc.*, 1898, xxx, 1334-1336.

1899.

- Dunn (J.), Uricacidemia as the Cause of Hay-fever and Asthma. *Charlotte Med. Jour.*, 1899, xv, 171-177.
- Rixa (A.), Prevention of Hay-fever. *J. Am. Med. Assoc.*, Chicago, 1899, xxxii, 120.
- Wright (E. W.), The Prevention of Hay-fever. *N. Y. Med. Jour.*, May 6, 1899.

INDEX.

A

- Age, influence of, 55
Allen, Harrison, 26, 63
Anglo-Saxon races, frequency of cases in the, 47
Areas, sensitive nasal, 62, 87
Arnold, 13, 81
Ascaris megalcephala as a cause, 38
Ashhurst, Samuel, 61
Asthma as a late symptom, 84
 diagnosis from, 94
 treatment of, 121
Atlantic, cases on the, 50
Australia, cases in, 49

B

- Bacteriologic study of nasal secretions, 103
Bastian, 38
Beard, G. M., 25, 33, 34, 48, 51, 52, 54, 56, 57, 72, 79, 88, 94, 98
Beecher, Henry Ward, cases in the family of, 53
Benzoic acid, as a cause, 36
Beschorner, 18
Bibliography, 127
Binz, C., 22
Bishop, S. S., 27, 64, 65, 66
Blackley, Chas. H., 13, 24, 35, 55

- Blackley, experiments of, 40
Blossoming dates, mutability of, 45
Bostock, J., 19, 30
Bosworth, 51, 53, 59, 63, 64, 73, 74, 76, 85, 91, 94, 99
Botallus, 18
Broussais, 39
Bullette, W. M., 52, 100

C

- Canada, cases in, 50
Capp, W. M., 67, 90
Cardiac involvement, 86
Caterpillars as a cause, 38
Causes, exciting, 30
 predisposing, 47
Cavernous tissue, nasal, 92
Chaveau, 48
Chills, analogy to recurrence of, 74
Chocolate as a cause, 37
Cinders as an exciting cause, 34
Clark, Sir Andrew, 27
Cleansing of the nares, 115
Cocain, 113
Coffee as a cause, 37
Complications, 84
Conklin, 65
Cornaz, 21
Coryza, diagnosis from, 95
Cottonwood fever, 51
Cough as a symptom, 82

Cough, persistent, between paroxysms, 84
 Cullen, 37
 Cutaneous eruptions as complications, 85

D

Daly, W. H., 26, 62
 Darwin, 45
 Definition, 10
 Denmark, cases in, 49
 Diagnosis, 94
 Diatheses, theory, 16
 Diet, 120
 Discharges, nasal, 82
 Drenger, 39
 Duration, 76
 Dust as a cause, 19, 34
 Dysphagia as a symptom, 82

E

Ebstein, 65
 Elliotson, 18, 20
 Emanations from dry hay as a cause, 19
 England, distribution of cases in, 49
 Erectile tissues, nasal, 92
 Eucain, 113
 Exciting causes, 30
 Experiments of Blackley on the pollen theory, 40
 Eye-symptoms, 81

F

Fatigue as a cause, 19
 Feathers as a cause, 37
 Fever during an attack, 83
 Floyer, 18
 France, cases in, 49
 French, rarity of cases among the, 48

Fruit as a cause, 37
 Fungoid growth as a cause, 14

G

Gaslight, influence of, 33
 Gastro-intestinal causes, 70
 General remarks, 12
 Genito-urinary organs, involvement of, 83
 Germans, rarity of cases among the, 48
 Germany, cases in, 49
 Gibbons, 99
 Grasses, varieties of, causative, 43
 Grayson, C. P., 28, 68
 Gream, G. Y., 20

H

Hack, W., 26, 60, 62
 Haig, 64
 "Hair-caterpillar asthma," 38
 Handkerchiefs, effluvia from, as a cause, 37
 Hare, odor of, as a cause, 38
 Heart, involvement of, 86
 Heat as a cause, 19, 30
 Helmholtz, 14, 22, 36
 Heredity, influence of, 52
 Herzog, 62
 Holmes, E. W., 35, 45, 47, 55, 56, 61, 63, 68, 80, 91, 94
 Horses, odor of, as a cause, 38
 Hünerswolff, 39
 Hygienic treatment, 116

I

Idiosyncrasy, influence of, 60
 Imagination, influence of, 39, 74
 India, cases in, 49
 Indian, case in an, 48
 Indigestion as a cause, 69

Ingals, 33
 Insomnia as a symptom, 82
 Insurance, effect on, 98
 Intermittent fever, analogy to, 74
 Ipecac as a cause, 37
 Italy, cases in, 49
 Itzigson, 37
 Ivy-poisoning, analogy to, 44

J

Jacobi, 48

K

Kinnear, 59

L

Labosse, 21
 Laforgue, 20
 Life insurance, effect on, 98
 mode of, influence of, 56
 Light as a cause, 32
 Linseed meal as a cause, 37
 Local disease theory, 17, 62
 treatment, 107
 Locust-tree blossoms as a cause, 37
 Longevity, effect on, 98
 Lycopodium as a cause, 37

M

MacCulloch, 20
 Macdonald, 28, 49, 79, 99
 Mackenzie, J. N., 26, 39, 48, 59, 62, 63, 74, 88
 Mackenzie, Morell, 27, 33, 39, 40, 53, 54, 56, 60, 76, 87, 117
 Males, prevalence in, 54
 Mango-tree as a cause, 44
 Marsh, E. J., 25, 44
 Mattress as a cause, 39
 May apple as a cause, 37
 Mays, Thomas J., 65
 Micro-organisms in the nasal discharges, 22

Moore, George, 23
 Mucous membrane, nasal, 93
 Mulberry blossoms as a cause, 37
 Muller, J., 70
 Murchison, 65
 Murrell, William, 37, 38
 Mustard as a cause, 37
 Mutability of blossoming dates, 45

N

Name, origin of, 19
 Nasal abnormalities as causes, 12
 symptoms, 81
 Negro, case in a, 48
 Nervous supply to the nares, 89
 Nettle-rash as a complication, 84
 Neurasthenic cases, 117
 Neurotic element, 15
 theory, 57
 New Zealand, cases in, 49
 Norway, cases in, 49
 Nose, coldness of, 79
 Nutrition, defective, a cause, 68

O

Oak as a cause, 37
 Obstruction of the nares as a cause, 63
 Occupation, influence of, 56
 Occurrence, time of, 72
 Ocean, cases on the, 44
 Odors of fruits and flowers as causes, 39
 Onset, symptoms of, 81
 Origin of the name, 19
 Ozone as a cause, 35

P

Parry, C. L., 18
 Pathology, 87
 Peaches, odor of, as a cause, 39
 Periodicity, 80
 Phœbus, P., 20, 31, 32, 35, 54, 74

Pirrie, W., 22, 31, 33, 49
 Pneumonia as a complication, 86
 Podophyllum as a cause, 37
 Pollen, first reference to, 13
 kinds of, 42
 theory, 40
 Polypi, Bosworth's views relative to, 63
 Prater, Augustus, 20
 Predisposing causes, 47
 Premonitory symptoms, 78
 Prince, M., 54, 59, 74, 75
 Proctor, Richard, case of, 32
 Prognosis, 98
 Prophylactic treatment, 116
 Protoplasmic substance as a cause, 15
 Pruritus ani during an attack, 83
 Psychic influence in the causation, 39, 74
 Pulse during an attack, 83

Q

Quinin solution as a remedy, 23
 Quinquaud, 65

R

Race, influence of, 47
 Rag-weed as an exciting cause, 43
 Ramadge, 20
 Rectum, involvement of, 83
 Recurrence, period of, 72
 Regions of the nasal cavities, 87
 Riedlin, 18
 Ringer, 38
 Roberts, W. C., 23, 79
 Robinson, B., 60
 Roe, J. O., 26, 62, 90
 Roman wormwood as an exciting cause, 53
 Russia, cases in, 49

S

Sajous, C. E. de M., 26, 48, 53, 62, 78, 90
 Salter, Hyde, 21, 38
 Scotland, cases in, 49
 Sea, cases at, 44
 Sensitive areas of the nares, 62, 87
 Sequelæ, 84
 Serum, nasal, 88
 Sex, influence of, 54
 Smell, involvement of, 86
 Smith, Ward, 37
 Smith, W. A., 22, 44, 47, 50
 Sneezing in, 81, 95
 Solis-Cohen, J., 59
 Solis-Cohen, S., 60
 South America, cases in, 49
 Spain, cases in, 49
 Spontaneous disappearance of the recurrences, 100
 Sterilization of the nares, 115
 Strangways, W. F., 14
 Sunlight, influence of, 33
 Sunshine as a cause, 19
 Suprarenal extract, 114
 Surgical treatment, 114
 Swallowing, difficult, 82
 Sweden, cases in, 49
 Symptoms, 78
 Synonyms, 9
 Systemic treatment, 116

T

Taste, involvement of, 86
 Tea-drinking, influence of, 48
 Temperature during an attack, 83
 Theory, idiosyncrasy, 60
 local, 17, 62
 neurotic, 57
 pollen, 40
 uric-acid, 64
 Thornwaldt, 64
 Timæus, 18

Time of occurrence, 72
 Tomatoes as a cause, 37
 Toxin as a cause, 13
 Treatment, 102
 preliminary local, 106
 prophylactic, hygienic, and
 systemic, 116
 surgical, 114
 Trosseau, 39
 Types, 78
 according to duration, 77

U

United States, distribution of
 cases in the, 50
 Uric-acid theory, 64

V

Van Helmont, 18
 Vasomotor control, nasal, 88
 susceptibility, theory of, 59
 Vibrios in the discharges, 22
 Vogel, 36
 Voice, changes in, 83

W

Walshe, 21, 44, 50
 Watermelons as a cause, 37
 Watson, 21
 Sir Thomas, 37
 White Mountains, immunity in,
 51
 Wilson, J. C., 44
 Wyman, Morrill, 23, 48, 50, 51,
 53, 54, 55

HUMPHREY'S MANUAL OF NURSING.

MEDICAL AND SURGICAL.

A complete Text-Book for Nurses, including General Anatomy and Physiology, Management of the Sick-Room, Appliances used in Sick-Room, Antiseptic Treatment, Bandaging, Cooking for Invalids, etc., etc.

Sixteenth Edition. With 79 Illustrations.

BY LAWRENCE HUMPHREY, M. A., M. D.

12MO. CLOTH. PRICE \$1.00.

ST. JOSEPH'S HOSPITAL,
SEVENTEENTH AND GIRARD AVENUE,
PHILADELPHIA, March 15, 1893.

Messrs. P. Blakiston, Son & Co.:—

Please send us six more copies of Manual of Nursing, by Humphrey. We do not know of any book that more completely meets the requirements of a Training Class than Dr. Humphrey's able Lectures, for they are at once clear, concise, and thoroughly practical.

SISTERS OF CHARITY.

From British Medical Journal, London.

"Nursing literature is expanding, and, what is more to the purpose, it shows manifold signs of improvement with its growth. In the fullest sense, Dr. Humphrey's book is a distinct advance on all previous manuals. It is, in point of fact, a concise treatise on medicine and surgery for the beginner, incorporating with the text the management of childbed and the hygiene of the sick-room. Its value is greatly enhanced by copious wood-cuts and diagrams of the bones and internal organs, by many illustrations of the art of bandaging, by temperature charts indicative of the course of some of the most characteristic diseases, and by a goodly array of sick-room appliances, with which every nurse should endeavor to become acquainted. . . . The systematic arrangement of subjects adopted by the author is excellent."

THE BEST GENERAL TEXT-BOOK.

BOOKS ON MASSAGE.

Massage and the Original Swedish Movements. Illustrated. And Their Application to Various Diseases of the Body. A Manual for Students, Nurses, and Physicians. By KURRE W. OSTROM, from the Royal University of Upsala, Sweden; formerly Instructor in Massage and Swedish Movements in the Hospital of the University of Pennsylvania and in the Philadelphia Polyclinic and College for Graduates in Medicine, etc. Illustrated by 105 explanatory Wood Engravings. Fourth Edition, Revised and Enlarged. 12mo. 168 pages. Cloth, \$1.00

“Mr. Ostrom presents to the English public this excellent, systematic manual, showing, by illustrations, the various movements and the mode of application to all parts of the body. The writer tells for what diseases such movements are indicated, with some remarks on the physiology of the movement treatment.”
—*From The Philadelphia Public Ledger.*

“In this volume the author gives an excellent description of the methods of massage and Swedish movement, together with their applicability to various diseased conditions of the body. The methods are rapidly becoming popularized in our own country, and the perusal of such a book as Mr. Ostrom has written will be of great advantage to physicians, for whose use it is mainly intended.”—*From the Journal of the American Medical Association.*

WARD. Notes on Massage; Including Elementary Anatomy and Physiology. By JESSIE M. WARD, Instructor in Massage in the Pennsylvania, Philadelphia, Jefferson, and Woman's Hospitals; Clinical Lecturer at Philadelphia Polyclinic. 12mo. Interleaved. Paper cover, \$1.00

SURGICAL NURSING.

BY BERTHA M. VOSWINKEL,

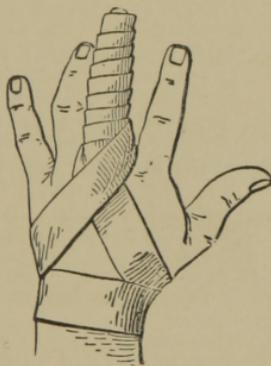
*Graduate of the Episcopal Hospital, Philadelphia; late Nurse-in-Charge of
Children's Hospital, Columbus, O.*

INCLUDING COMPLETE CHAPTERS ON
BANDAGING, DRESSINGS,
SPLINTS, ETC.

SECOND EDITION—ENLARGED. JUST READY.

112 Illustrations. 12mo. 206 Pages. Cloth, \$1.00.

SYNOPSIS OF CONTENTS.—I. Introductory Remarks, Care of Patient, Beds, etc.—II. Qualifications of Surgical Nurse—III. Antiseptics and Antiseptic Surgery—IV. Antiseptic Dressings—V and VI. Gynecologic Nursing—VII and VIII. Hemorrhages—IX. Wounds and their Complications—X. Fractures, Dislocations, Sprains—XI. Nursing in Special Cases—XII. Bandaging—XIII. Fixed Dressings—XIV. Splints and Braces—XV. Massage—Appendix A. Invalid Cookery—Appendix B. Enemas, Ice Poultrice, Excessive Perspiration, Weights and Measures, Bichlorid Table, Poisons—Appendix C. Preparation of Patient for Transfusion, Normal Salt Solution, Preparation of Rubber Tissue, Kronig's Method of Sterilizing Catgut—Index.



*Sample Illustration from
Voswinkel's Surgical
Nursing.*

From **The Chicago Medical Recorder.**

“The book is eminently practical and concise. The author's style and methods are excellent.”

THE
AMERICAN HEALTH PRIMERS.

EDITED BY W. W. KEEN, M.D.,

Professor of Surgery in the Jefferson Medical College, Fellow of the College of Physicians of Philadelphia, etc.

12 Vols. 32mo. Attractive Cloth Binding, each 40 Cents.

This Series of HEALTH PRIMERS is prepared to diffuse as widely and cheaply as possible, among all classes, a knowledge of the elementary facts of Preventive Medicinæ. They are intended incidentally to assist in curing diseases, and to teach people how to form correct habits of living, and take care of themselves, their children, employees, etc.

- I. HEARING AND HOW TO KEEP IT. With Illustrations. By CHAS. H. BURNETT, M.D., of Philadelphia, Aurist to the Presbyterian Hospital.
- II. LONG LIFE AND HOW TO REACH IT. By J. G. RICHARDSON, M.D., of Philadelphia, late Professor of Hygiene in the University of Pennsylvania.
- III. THE SUMMER AND ITS DISEASES. By JAMES C. WILSON, M.D., of Philadelphia, Professor of the Practice of Medicine, Jefferson Medical College.
- IV. EYESIGHT AND HOW TO CARE FOR IT. With Illustrations. By GEORGE C. HARLAN, M.D., of Philadelphia, Surgeon to the Wills (Eye) Hospital.
- V. THE THROAT AND THE VOICE. With Illustrations. By J. SOLIS COHEN, M.D., of Philadelphia, Lecturer on Diseases of the Throat in Jefferson Medical College, and on the Voice in the National School of Oratory.
- VI. THE WINTER AND ITS DANGERS. By HAMILTON OSGOOD, M.D., of Boston, Editorial Staff *Boston Medical and Surgical Journal*.
- VII. THE MOUTH AND THE TEETH. With Illustrations. By J. W. WHITE, M.D., D.D.S., of Philadelphia, Editor of the *Dental Cosmos*.
- VIII. BRAIN WORK AND OVERWORK. By H. C. WOOD, JR., M.D., of Philadelphia, Clinical Professor of Nervous Diseases in the University of Pennsylvania.
- IX. OUR HOMES. With Illustrations. By HENRY HARTSHORNE, M.D., of Philadelphia, formerly Professor of Hygiene in the University of Pennsylvania.
- X. THE SKIN IN HEALTH AND DISEASE. With Illustrations. By L. D. BULKLEY, M.D., of New York, Physician to the Skin Department of the New York Hospital.
- XI. SEA AIR AND SEA BATHING. With Illustrations. By JOHN H. PACKARD, M.D., of Philadelphia, Surgeon to the Pennsylvania Hospital.
- XII. SCHOOL AND INDUSTRIAL HYGIENE. By D. F. LINCOLN, M.D., of Boston, Mass., Chairman Department of Health, American Social Science Association.

"The series of 'American Health Primers' deserves hearty commendation. These handbooks of practical suggestions are prepared by men whose professional competence is beyond question, and, for the most part, by those who have made the subject treated the study of their lives."—*New York Sun*.

. Each Volume 40 Cents, in Attractive Cloth Binding.

FIFTH EDITION
ACCIDENTS AND EMERGENCIES.

A Manual for the treatment of Surgical and other Injuries, Poisoning and various Medical Emergencies, in the absence of the Physician.

By CHARLES W. DULLES, M.D.,

Surgeon to the Rush Hospital; formerly Surgeon to the Out-Door Departments of the University and Presbyterian Hospitals, Philadelphia.

Fifth Edition, Enlarged. New Illustrations. 12mo. . . . Cloth, \$1.00
ILLUSTRATED.

SHORT LIST OF CONTENTS.

Preliminary Remarks.
Obstructions to Respiration.
Foreign Bodies in the Eye, Nose and Ear.
Fits or Seizures.
Injuries to the Brain.
Effects of Heat and Cold.
Electricity, Accidents caused by.
Sprains.
Dislocations.
Fractures.
Wounds of all kinds, including the bites of Dogs, Cats, Snakes, Insects, etc.
Railroad and Machinery Accidents.

Hemorrhage—Bleeding.
Special Hemorrhages.
Transportation of the Injured.
Poisons and their Antidotes.
Domestic Emergencies, includes Cholera Morbus, Vomiting, Diarrhœa, Nervous Attacks, Earache, Toothache, Asthmatic Attacks, Croup, etc., etc.
Signs of Death.
Supplies for Emergencies.
The Surgical and Medicine Case, their contents and use, Bandaging, Poultrices, etc.
Index.

* * * This book should be in the possession of every head of a family, Nurse, Manufacturer, Police Lieutenant, Sea Captain, Hospital Steward, School Teacher, Druggist, etc. etc.

"Several attempts have been made to prepare a volume which would serve as a handy manual for reference in the time of need, in the absence of a doctor, but none have succeeded better than the present little work. It should be in the hands of all officers charged with the public conveyance of passengers, to be read, in preparation for emergencies, and afterward to serve as a book of reference."—*North Carolina Medical Journal*.

"This little manual contains simple directions for the preliminary treatment of accidents to all parts of the body and of such diseases as persons are suddenly seized with. Without profuseness or an unintelligible vocabulary, it contains in a small space a deal of useful information."—*New York World*.

"This is a revised and enlarged edition, with new illustrations, of the manual, explaining the treatment of surgical and other injuries in the absence of the physician. The simple and practical suggestions of this little book should be known to every one. Accidents are constantly occurring, and a knowledge of what should be done in an emergency is very valuable. Such a handbook should be in every home, placed where it can always be found readily."—*Boston Journal of Education*.

THE HYGIENE OF THE NURSERY.

INCLUDING THE GENERAL REGIMEN AND FEEDING OF INFANTS
AND CHILDREN AND THE DOMESTIC MANAGEMENT
OF THE ORDINARY EMERGENCIES OF
EARLY LIFE.

BY LOUIS STARR, M. D.,

*Clinical Professor of Diseases of Children in the Hospital of the University
of Pennsylvania; Physician to the Children's Hospital, Phila.*

SIXTH EDITION. ENLARGED AND IMPROVED.

WITH TWENTY-FIVE ILLUSTRATIONS.

12mo. 280 Pages. Cloth, \$1.00.

. This book contains very complete directions for the proper feeding of infants: 1st, From the maternal breast. 2d. By wet-nurse, including rules for choosing the woman. 3d, **Artificial Feeding.** This part of the subject is elaborated carefully, so as to include everything of importance, and will be found of great service to the monthly nurse. General and specific rules for feeding are given, and **Diet Lists** from the first week up to the eighteenth month, with various recipes for artificial foods, peptonized milk, etc. Directions for the sterilization of milk, substitutes for milk, preparation of food for both well and sick children, nutritious enemata, etc., and the general management of the Nursery.

“Dr. Starr's experience as Clinical Professor of Diseases of Children in the University Hospital and as physician to the Children's Hospital, with his eminence in private practice among juvenile patients, is ample warranty for the satisfaction and instruction to be found in this book. The dedication “To my Little Patients,” shows the sympathy with which the writer enters upon the important discussion. The volume is entirely in the modern lines of preventive medicine—more important in the nursery than at any other time of life; because constitution building is going on then and there. In this admirable treatise, so clearly written that no mother need be deterred by fear of medical terms from making its teaching her own, Dr. Starr carries out the highest ideal of the modern physician, so to regulate the lives of his professional clients that the occasions are less frequent when he need be called in to act for serious complications. * * * * With the numerous good treatises on the subject that Philadelphia publications include, this intelligent work is the most distinguished, as it is also the latest work on complete Hygiene of the Nursery.”—*The Ledger, Philadelphia.*

A HANDBOOK OF
MATERIA MEDICA

Including Sections on Therapeutics and Toxicology, and
a very complete Glossary of Terms with
Dose and use of each Drug.

SPECIALLY PREPARED FOR TRAINED NURSES.

BY JOHN E. GROFF, PH.G.,
Apothecary in the Rhode Island Hospital, Providence.

235 PAGES. 12MO. HANDSOMELY BOUND IN CLOTH, \$1.25.

* * In preparing this work the author has endeavored to present the extensive subject of Materia Medica in a systematic form, sufficiently comprehensive to meet the requirements of the trained nurse.

The work is intended to make the nurse acquainted with the numerous drugs of vegetable and chemic origin, their Latin and English names, the parts of the plants used, the names of and something about the preparations, the chemicals used as medicines, the handling of them, etc. A set of questions follow each chapter, and there are many explanatory foot-notes and paragraphs.

From the *Medical Record*, New York.

"It will undoubtedly prove a valuable aid to the nurse in securing a knowledge of drugs and their uses."

From the *Philadelphia Medical Journal*.

"The task of abridging the subject of materia medica for the use of trained nurses is far from an easy one, as it is necessary to use good judgment in putting in what it would be well and helpful for her to know without leaving out the necessary part. Moreover, to arrange the subject in a practical and systematic manner for the purpose of teaching and ready reference is a difficult matter. The author of this book has succeeded admirably in doing this, and the work is sure to be in great demand by nurses."

A NEW EDITION, JUST READY.

GOULD'S POCKET MEDICAL LEXICON.

21,000 MEDICAL WORDS

PRONOUNCED AND DEFINED.

A Pronouncing Lexicon of Medical Words Specially Adapted for Nurses, Including Many Useful Tables and a Dose List.



BY GEORGE M. GOULD, M.D.,

Author of "An Illustrated Dictionary of Medicine, Biology, and Allied Sciences," "The Student's Medical Dictionary," etc.

Pocket Size. 522 Pages. Gilt Edges, Full Morocco. Price \$1.00; with a Thumb Index, \$1.25.

OVER 90,000 COPIES OF GOULD'S
DICTIONARIES HAVE BEEN SOLD.

"Gould's Dictionary, Pocket Edition, is the most complete and convenient I have seen."—*Marion E. Smith, Head Nurse, Philadelphia Hospital, Phila.*

"The Pocket Dictionary is a little gem."—*L. J. Gross, Head Nurse, Buffalo General Hospital.*

"I have examined Gould's Dictionary, and consider it the best dictionary in a small compass that I have seen. The price, too, is most reasonable. I shall recommend it to all our nurses."—*F. Hutcheson, Head Nurse, Flower Mission Training School for Nurses, Indianapolis, Ind.*

"I shall certainly have the nurses each send for a copy of the dictionary. It is just what they need, and is a nice size to carry."—*Harriet Sutherland, Head Nurse, Margaret Pillsbury Hospital, Concord, N. H.*

Every nurse should have a copy of this little book in order to intelligently pursue her studies and to thoroughly understand the physician's directions. It furnishes a vast amount of information not to be obtained in the regular text-books.

CLASSIFIED SUBJECT
CATALOGUE
OF
MEDICAL BOOKS

AND

Books on Medicine, Dentistry, Pharmacy,
Chemistry, Hygiene, Etc., Etc.,

PUBLISHED BY

P. BLAKISTON'S SON & Co.,

Medical Publishers and Booksellers,

1012 WALNUT STREET, PHILADELPHIA.

SPECIAL NOTE.—The prices given in this catalogue are absolutely net, no discount will be allowed retail purchasers under any consideration. This rule has been established in order that everyone will be treated alike, a general reduction in former prices having been made to meet previous retail discounts. Upon receipt of the advertised price any book will be forwarded by mail or express, all charges prepaid.

We keep a large stock of Miscellaneous Books, not on this catalogue, relating to Medicine and Allied Sciences, published in this country and abroad. Inquiries in regard to prices, date of edition, etc., will receive prompt attention.

Special Catalogues of Books on Pharmacy, Dentistry, Chemistry, Hygiene, and Nursing will be sent free upon application.

SEE NEXT PAGE FOR SUBJECT INDEX.

Gould's Dictionaries, Page 8.

SUBJECT INDEX.

Any books not on this Catalogue we will furnish a price for upon application.

SUBJECT	PAGE	SUBJECT.	PAGE
Alimentary Canal (see Surgery)	19	Nose.....	20
Anatomy (see Miscellaneous)	14	Nursing	15
Anesthetics	3	Obstetrics.....	16
Autopsies (see Pathology)	16	Ophthalmology.....	9
Bacteriology (see Pathology)	16	Osteology (see Anatomy).....	3
Bandaging (see Surgery).....	19	Pathology	16
Brain	4	Pharmacy	16
Chemistry	4	Physical Diagnosis	17
Children, Diseases of	6	Physical Training (see Miscellaneous)	14
Clinical Charts.....	6	Physiology	18
Compendis	22, 23	Poisons (see Toxicology)	13
Consumption (see Lungs).....	11	Popular Medicine.....	10
Dentistry	7	Practice of Medicine	18
Diagnosis	17	Prescription Books.....	18
Diagrams (see Anatomy, page 3, and Obstetrics, page 16).		Railroad Injuries (see Nervous Diseases).....	14
Dictionaries	8	Refraction (see Eye)	9
Diet and Food (see Miscellaneous)	14	Rheumatism	10
Dissectors	3	Sanitary Science	11
Domestic Medicine	10	Skin.....	19
Ear	8	Spectacles (see Eye)	9
Electricity	9	Spine (see Nervous Diseases)	14
Emergencies (see Surgery).....	19	Stomach (see Miscellaneous).....	14
Eye	9	Students' Compendis.....	22, 23
Fevers	9	Surgery and Surgical Diseases.....	19
Gout	10	Syphilis	21
Gynecology	21	Technological Books.....	4
Hay Fever.....	20	Temperature Charts.....	6
Heart	10	Therapeutics	12
Histology.....	10	Throat	20
Hospitals (see Hygiene).....	11	Toxicology.....	13
Hygiene.....	11	Tumors (see Surgery).....	19
Insanity	4	U. S. Pharmacopœia	22, 16
Latin, Medical (see Miscellaneous and Pharmacy).....	14, 16	Urinary Organs	20
Lungs	14, 12	Urine	20
Massage.....	12	Venereal Diseases.....	21
Materia Medica.....	12	Veterinary Medicine.....	21
Medical Jurisprudence	13	Visiting Lists, Physicians' (Send for Special Circular.)	
Microscopy	13	Water Analysis (see Chemistry)	4
Milk Analysis (see Chemistry)	4	Women, Diseases of.....	21
Miscellaneous	14		
Nervous Diseases	14		

The prices as given in this Catalogue are net. Cloth binding, unless otherwise specified. No discount can be allowed under any circumstances. Any book will be sent, postpaid, upon receipt of advertised price.

All books are bound in cloth, unless otherwise specified. All prices are net.

ANATOMY.

- MORRIS.** *Text-Book of Anatomy.* 2d Edition. Revised and Enlarged. 790 Illustrations, 214 of which are printed in colors. *Just Ready.* Cloth, \$6.00; Leather, \$7.00; Half Russia, \$8.00
 "Taken as a whole, we have no hesitation in according very high praise to this work. It will rank, we believe, with the leading Anatomies. The illustrations are handsome and the printing is good."—*Boston Medical and Surgical Journal.*
 Handsome Circular of Morris, with sample pages and colored illustrations, will be sent free to any address.
- BROOMELL.** *Anatomy and Histology of the Human Mouth and Teeth.* 284 Illustrations. \$4 50
- DEAVER.** *Surgical Anatomy.* A Treatise on Human Anatomy in its Application to Medicine and Surgery. With about 400 very Handsome full-page Illustrations Engraved from Original Drawings made by special Artists from dissections prepared for the purpose. Three Volumes. Royal Square Octavo
 Cloth, \$2.00; Half Morocco or Sheep, \$24.00; Half Russia, \$27.00
- ECKLEY.** *Practical Anatomy.* A Manual for the use of Students in the Dissecting Room. Based upon Morris' *Text-Book of Anatomy.* With over 200 Illustrations. *Nearly Ready.*
- GORDINIER.** *Anatomy of the Central Nervous System.* With many Illustrations, the majority of which are original. *Just Ready.* Cloth, \$6.00; Sheep, \$7.00
- HEATH.** *Practical Anatomy.* 8th Edition. 300 Illus. \$4.25
- HOLDEN.** *Anatomy.* A Manual of the Dissections of the Human Body. Carefully Revised by A. HEWSON, M.D., Demonstrator of Anatomy, Jefferson Medical College, Philadelphia. 311 Illustrations. 7th Edition. *In Press.*
- HOLDEN.** *Human Osteology.* Comprising a Description of the Bones, with Colored Delineations of the Attachments of the Muscles. The General and Microscopical Structure of Bone and its Development. With Lithographic Plates and numerous Illus. 8th Ed. \$5.25
- HOLDEN.** *Landmarks.* Medical and Surgical. 4th Ed. \$1.00
- MACALISTER.** *Human Anatomy.* Systematic and Topographical, including the Embryology, Histology, and Morphology of Man. With Special Reference to the Requirements of Practical Surgery and Medicine. 816 Illustrations. Cloth, \$5.00; Leather, \$6.00
- MARSHALL.** *Physiological Diagrams.* Life Size, Colored. Eleven Life-Size Diagrams (each seven feet by three feet seven inches). Designed for Demonstration before the Class.
 In Sheets, Unmounted, \$40.00; Backed with Muslin and Mounted on Rollers, \$60.00; Ditto, Spring Rollers, in Handsome Walnut Wall Map Case, \$100.00; Single Plates—Sheets \$5.00; Mounted, \$7.50. Explanatory Key, .50. *Descriptive circular upon application.*
- POTTER.** *Compend of Anatomy, Including Visceral Anatomy.* 6th Ed. 16 Lith. Plates and 117 other Illus. .80; Interleaved, \$1.25
- WILSON.** *Human Anatomy.* 11th Edition. 429 Illustrations, 26 Colored Plates, and a Glossary of Terms. \$5.00
- WINDLE.** *Surface Anatomy and Landmarks.* Colored and other Illustrations. \$1.00

BRAIN AND INSANITY.

- BLACKBURN.** A Manual of Autopsies. Designed for the Use of Hospitals for the Insane and other Public Institutions. Ten full-page Plates and other Illustrations. \$1.25
- GORDINIER.** The Gross and Minute Anatomy of the Central Nervous System. With many full-page and other Illustrations. 8vo. *Just Ready.* Cloth, \$6.00; Sheep, \$7.00
- GOWERS.** Diagnosis of Diseases of the Brain. 2d Edition. Illustrated. \$1.50
- HORSLEY.** The Brain and Spinal Cord. The Structure and Functions of. Numerous Illustrations. \$2.50
- LEWIS (BEVAN).** Mental Diseases. A Text Book Having Special Reference to the Pathological Aspects of Insanity. 26 Lithographic Plates and other Illustrations. 2d Ed. *Just Ready.* \$7.00
- MANN.** Manual of Psychological Medicine and Allied Nervous Diseases. Their Diagnosis, Pathology, Prognosis, and Treatment, including their Medico-Legal Aspects; with chapter on Expert Testimony, and an Abstract of the Laws Relating to the Insane in all the States of the Union. Illustrated. \$3.00
- REGIS.** Mental Medicine. Authorized Translation by H. M. BANNISTER, M.D. \$2.00
- STEARNS.** Mental Diseases. Designed especially for Medical Students and General Practitioners. With a Digest of Laws of the various States Relating to Care of Insane. Illustrated. Cloth, \$2.75; Sheep, \$3.25
- TUKE.** Dictionary of Psychological Medicine. Giving the Definition, Etymology, and Symptoms of the Terms used in Medical Psychology, with the Symptoms, Pathology, and Treatment of the Recognized Forms of Mental Disorders, together with the Law of Lunacy in Great Britain and Ireland. Two volumes. \$10.00
- WOOD, H. C.** Brain and Overwork. .40

CHEMISTRY AND TECHNOLOGY.

Special Catalogue of Chemical Books sent free upon application.

- ALLEN.** Commercial Organic Analysis. A Treatise on the Modes of Assaying the Various Organic Chemicals and Products Employed in the Arts, Manufactures, Medicine, etc., with concise methods for the Detection of Impurities, Adulterations, etc. 8vo.
- Vol. I. Alcohols, Neutral Alcoholic Derivatives, etc.; Ethers, Vegetable Acids, Starch, Sugars, etc. 3d Edition, by HENRY LEFFMANN, M. D. *Just Ready.* \$4.50
- Vol. II, Part I. Fixed Oils and Fats, Glycerol, Explosives, etc. 3d Edition, by HENRY LEFFMANN, M. D. *Just Ready.* \$3.50
- Vol. II, Part II. Hydrocarbons, Mineral Oils, Phenols, etc. 3d Edition, by HENRY LEFFMANN, M. D. *Nearly Ready.*
- Vol. III, Part I. Acid Derivatives of Phenols, Aromatic Acids, Tannins, Dyes and Coloring Matters. 3d Edition. *In Preparation.*
- Vol. III, Part II. The Amines, Hydrazines and Derivatives, Pyridine Bases. The Antipyretics, etc. Vegetable Alkaloids, Tea, Coffee, Cocoa, etc. 8vo. 2d Edition. \$4.50
- Vol. III, Part III. Vegetable Alkaloids, Non-Basic Vegetable Bitter Principles. Animal Bases, Animal Acids, Cyanogen Compounds, etc. 2d Edition, 8vo. \$4.50
- Vol. IV. The Proteids and Albuminous Principles. 2d Edition. *Just Ready.* \$4.50
- APPENDIX VOLUME.** Containing a Review of the whole work with many new methods, etc. *In Preparation.*

- ALLEN. Chemical Analysis of Albuminous and Diabetic Urine. Illustrated. \$2.25
- BARTLEY. Medical and Pharmaceutical Chemistry. A Text-Book for Medical, Dental, and Pharmaceutical Students. With Illustrations, Glossary, and Complete Index. 5th Edition, carefully Revised. *Just Ready.* Cloth, \$3.00; Sheep, \$3.50
- BARTLEY. Clinical Chemistry. The Examination of Feces, Saliva, Gastric Juice, Milk, and Urine. *Just Ready.* \$1.00
- BLOKAM. Chemistry, Inorganic and Organic. With Experiments. 8th Ed., Revised 281 Engravings Clo., \$4.25; Lea., \$5.25
- CALDWELL. Elements of Qualitative and Quantitative Chemical Analysis. 3d Edition, Revised. \$1.50
- CAMERON. Oils and Varnishes. With Illustrations. \$2.25
- CAMERON. Soap and Candles. 54 Illustrations. \$2.00
- GARDNER. The Brewer, Distiller, and Wine Manufacturer. Illustrated. \$1.50
- GARDNER. Bleaching, Dyeing, and Calico Printing. \$1.50
- GROVES AND THORP. Chemical Technology. The Application of Chemistry to the Arts and Manufactures.
Vol. I. Fuel and Its Applications. 607 Illustrations and 4 Plates. Cloth, \$5.00; Half Morocco, \$6.50
Vol. II. Lighting. Illustrated. Cloth, \$4.00; Half Morocco, \$5.50
Vol. III. Lighting—Continued. *In Press.*
- HOLLAND. The Urine, the Gastric Contents, the Common Poisons, and the Milk. Memoranda, Chemical and Microscopical, for Laboratory Use. 5th Ed. Illustrated and interleaved, \$1.00
- LEFFMANN. Compend of Medical Chemistry, Inorganic and Organic. Including Urine Analysis. 4th Edition, Rewritten and Revised. 80; Interleaved, \$1.25
- LEFFMANN. Analysis of Milk and Milk Products. Arranged to Suit the Needs of Analytical Chemists, Dairymen, and Milk Inspectors. 2d Edition. Enlarged, Illustrated. \$1.25
- LEFFMANN. Water Analysis. Illustrated. 4th Edition. \$1.25
- LEFFMANN. Structural Formulæ. Including 180 Structural and Stereo-Chemical Formulæ. 12mo. Interleaved. \$1.00
- MUTER. Practical and Analytical Chemistry. 2d American from the Eighth English Edition. Revised to meet the requirements of American Medical Colleges by CLAUDE C. HAMILTON, M.D. 56 Illustrations. *Just Ready.* \$1.25
- OETTEL. Exercises in Electro-Chemistry. Illustrated. .75
- OETTEL. Electro-Chemical Experiments. Illustrated. .75
- RICHTER. Inorganic Chemistry. 4th American, from 6th German Edition. Authorized translation by EDGAR F. SMITH, M.A., PH.D. 89 Illustrations and a Colored Plate. \$1.75
- RICHTER. Organic Chemistry. 3d American Edition. Trans. from the 8th German by EDGAR F. SMITH. Illustrated. 2 Volumes. Vol. I. Aliphatic Series. 625 Pages. *Just Ready.* \$3.00
Vol. II. Aromatic Series. *In Preparation.*
- SMITH. Electro-Chemical Analysis. 2d Edition, Revised. 28 Illustrations. \$1.25
- SMITH AND KELLER. Experiments. Arranged for Students in General Chemistry. 3d Edition. Illustrated. .60
- STAMMER. Chemical Problems. With Answers. 50

- SUTTON. Volumetric Analysis.** A Systematic Handbook for the Quantitative Estimation of Chemical Substances by Measure, Applied to Liquids, Solids, and Gases. 7th Edition, Revised. 112 Illustrations. \$4.50
- SYMONDS. Manual of Chemistry, for Medical Students.** 2d Edition. \$2.00
- TRAUBE. Physico-Chemical Methods.** Translated by Hardin. 97 Illustrations. *Just Ready.* \$1.50
- ULZER AND FRAENKEL. Chemical Technical Analysis.** Translated by Fleck. Illustrated. *Just Ready.* \$1.25
- WOODY. Essentials of Chemistry and Urinalysis.** 4th Edition. Illustrated. *In Press.*

* * * *Special Catalogue of Books on Chemistry free upon application.*

CHILDREN.

- CAUTLIE. Feeding of Infants and Young Children by Natural and Artificial Methods.** \$2.00
- HALE. On the Management of Children.** .50
- HATFIELD. Compend of Diseases of Children.** With a Colored Plate. 2d Edition. .80; Interleaved, \$1.25
- MEIGS. Infant Feeding and Milk Analysis.** The Examination of Human and Cow's Milk, Cream, Condensed Milk, etc., and Directions as to the Diet of Young Infants. .50
- POWER. Surgical Diseases of Children and their Treatment by Modern Methods.** Illustrated. \$2.50
- STARR. The Digestive Organs in Childhood.** The Diseases of the Digestive Organs in Infancy and Childhood. With Chapters on the Investigation of Disease and the Management of Children. 2d Edition, Enlarged. Illustrated by two Colored Plates and numerous Wood Engravings. \$2.00
- STARR. Hygiene of the Nursery.** Including the General Regimen and Feeding of Infants and Children, and the Domestic Management of the Ordinary Emergencies of Early Life, Massage, etc. 6th Edition. 25 Illustrations. \$1.00
- TAYLOR AND WELLS. The Diseases of Children.** Illustrated. A New Manual. 746 pages. *Just Ready.* \$4.00

CLINICAL CHARTS.

- GRIFFITH. Graphic Clinical Chart for Recording Temperature, Respiration, Pulse, Day of Disease, Date, Age, Sex, Occupation, Name, etc.** Printed in three colors. Sample copies free. Put up in loose packages of fifty, .50. Price to Hospitals, 500 copies, \$4.00; 1000 copies, \$7.50. With name of Hospital printed on, .50 extra.
- KEEN'S CLINICAL CHARTS.** Seven Outline Drawings of the Body, on which may be marked the Course of Disease, Fractures, Operations, etc. Pads of fifty, \$1.00. Each Drawing may also be had separately, twenty-five to pad, 25 cents.

SCHREINER. Diet Lists. Arranged in the form of a chart. With Pamphlets of Specimen Diets. Pads of 50. .75

DENTISTRY.

Special Catalogue of Dental Books sent free upon application.

- BARRETT.** Dental Surgery for General Practitioners and Students of Medicine and Dentistry. Extraction of Teeth, etc. 3d Edition. Illustrated. *Nearly Ready.* \$4.50
- BLODGETT.** Dental Pathology. By ALBERT N. BLODGETT, M.D., late Professor of Pathology and Therapeutics, Boston Dental College. 33 Illustrations. \$1.25
- BROOMELL.** Anatomy and Histology of the Human Mouth and Teeth. 284 Handsome Illustrations. *Just Ready.* \$4.50
- FLAGG.** Plastics and Plastic Filling, as Pertaining to the Filling of Cavities in Teeth of all Grades of Structure. 4th Edition. \$4.00
- FILLEBROWN.** A Text-Book of Operative Dentistry. Written by invitation of the National Association of Dental Faculties. Illustrated. \$2.25
- GORGAS.** Dental Medicine. A Manual of Materia Medica and Therapeutics. 6th Edition, Revised. Cloth, \$4.00; Sheep, \$5.00
- HARRIS.** Principles and Practice of Dentistry. Including Anatomy, Physiology, Pathology, Therapeutics, Dental Surgery, and Mechanism. 13th Edition. Revised by F. J. S. GORGAS, M.D., D.E.S. 1250 Illustrations. Cloth, \$6.00; Leather, \$7.00
- HARRIS.** Dictionary of Dentistry. Including Definitions of Such Words and Phrases of the Collateral Sciences as Pertain to the Art and Practice of Dentistry. 6th Edition. Revised and Enlarged by FERDINAND F. S. GORGAS, M.D., D.D.S. Cloth, \$5.00; Leather, \$6.00
- HEATH.** Injuries and Diseases of the Jaws. 4th Edition. 187 Illustrations. \$4.50
- HEATH.** Lectures on Certain Diseases of the Jaws. 64 Illustrations. Boards, .50
- RICHARDSON.** Mechanical Dentistry. 7th Edition. Thoroughly Revised and Enlarged by DR. GEO. W. WARREN. 691 Illustrations. Cloth, \$5.00; Leather, \$6.00
- SEWELL.** Dental Surgery. Including Special Anatomy and Surgery. 3d Edition, with 200 Illustrations. \$2.00
- SMITH.** Dental Metallurgy. Illustrated. \$1.75
- TAFT.** Index of Dental Periodical Literature. \$2.00
- TALBOT.** Irregularities of the Teeth and Their Treatment. 2d Edition. 234 Illustrations. \$3.00
- TOMES.** Dental Anatomy. Human and Comparative. 263 Illustrations. 5th Edition. *Just Ready.* \$4.00
- TOMES.** Dental Surgery. 4th Edition. 289 Illustrations. \$4.00
- WARREN.** Compend of Dental Pathology and Dental Medicine. With a Chapter on Emergencies. 3d Edition. Illustrated. *Just Ready.* .80; Interleaved, \$1.25
- WARREN.** Dental Prosthesis and Metallurgy. 129 Ills. \$1.25
- WHITE.** The Mouth and Teeth. Illustrated. .40

** * * Special Catalogue of Dental Books sent free upon application.*

DICTIONARIES.

GOULD. The Illustrated Dictionary of Medicine, Biology, and Allied Sciences. Being an Exhaustive Lexicon of Medicine and those Sciences Collateral to it: Biology (Zoology and Botany), Chemistry, Dentistry, Pharmacology, Microscopy, etc., with many useful Tables and numerous fine Illustrations. 1633 pages. 4th Ed. Sheep or Half Dark Green Leather, \$10.00; Thumb Index, \$11.00
Half Russia, Thumb Index, \$12.00

GOULD. The Medical Student's Dictionary. Including all the Words and Phrases Generally Used in Medicine, with their Proper Pronunciation and Definition, Based on Recent Medical Literature. With Tables of the Bacilli, Micrococci, Mineral Springs, etc., of the Arteries, Muscles, Nerves, Ganglia, and Plexuses, etc. 10th Edition. Rewritten and Enlarged. Completely reset from new type. 700 pp. Half Dark Leather, \$3.25; Half Morocco, Thumb Index, \$4.00

GOULD. The Pocket Pronouncing Medical Lexicon. (21,000 Medical Words Pronounced and Defined.) Containing all the Words, their Definition and Pronunciation, that the Medical, Dental, or Pharmaceutical Student Generally Comes in Contact With; also Elaborate Tables of the Arteries, Muscles, Nerves, Bacilli, etc., etc., a Dose List in both English and Metric System, etc., Arranged in a Most Convenient Form for Reference and Memorizing. A new Edition, enlarged by 200 pages. *Just Ready.*

Full Limp Leather, Gilt Edges, \$1.00; Thumb Index, \$1.25
90,000 Copies of Gould's Dictionaries Have Been Sold.

** Sample Pages and Illustrations and Descriptive Circulars of Gould's Dictionaries sent free upon application.

HARRIS. Dictionary of Dentistry. Including Definitions of Such Words and Phrases of the Collateral Sciences as Pertain to the Art and Practice of Dentistry. 6th Edition. Revised and Enlarged by FERDINAND J. S. GORGAS, M.D., D.D.S. Cloth, \$5.00; Leather, \$6.00

LONGLEY. Pocket Medical Dictionary. With an Appendix, containing Poisons and their Antidotes, Abbreviations used in Prescriptions, etc. Cloth, .75; Tucks and Pocket, \$1.00

MAXWELL. Terminologia Medica Polyglotta. By Dr. THEODORE MAXWELL, Assisted by Others. \$3.00

The object of this work is to assist the medical men of any nationality in reading medical literature written in a language not their own. Each term is usually given in seven languages, viz.: English, French, German, Italian, Spanish, Russian, and Latin.

TREVES AND LANG. German-English Medical Dictionary. Half Russia, \$3.25

EAR (see also Throat and Nose).

BURNETT. Hearing and How to Keep It. Illustrated .40

DALBY. Diseases and Injuries of the Ear. 4th Edition. 38
Wood Engravings and 8 Colored Plates. \$2.50

HOVELL. Diseases of the Ear and Naso-Pharynx. Including Anatomy and Physiology of the Organ, together with the Treatment of the Affections of the Nose and Pharynx which Conduce to Aural Disease. 122 Illustrations. 2d Edition. *Preparing.*

PRITCHARD. Diseases of the Ear. 3d Edition, Enlarged. Many Illustrations and Formulæ. \$1.50

WOAKES. Deafness, Giddiness, and Noises in the Head. 4th Edition. Illustrated. \$2.00

ELECTRICITY.

- BIGELOW.** Plain Talks on Medical Electricity and Batteries. With a Therapeutic Index and a Glossary. 43 Illustrations. 2d Edition. \$1.00
- JONES.** Medical Electricity. 3d Edition. 112 Illus. *In Press.*
- MASON.** Electricity; Its Medical and Surgical Uses. Numerous Illustrations. .75

EYE.

- A Special Circular of Books on the Eye sent free upon application.*
- ARLT.** Diseases of the Eye. Clinical Studies on Diseases of the Eye. Translation by LYMAN WARE, M.D. Illustrated. \$1.25
- DONDERS.** The Nature and Consequences of Anomalies of Refraction. With Portrait and other Illustrations. 8vo. *Just Ready.* Half Morocco, \$1.25
- FICK.** Diseases of the Eye and Ophthalmoscopy. Translated by A. B. HALE, M. D. 157 Illustrations, many of which are in colors, and a glossary. Cloth, \$4.50; Sheep, \$5.50
- GOULD AND PYLE.** Compend of Diseases of the Eye and Refraction. Including Treatment and Operations, and a Section on Local Therapeutics. With Formulæ, Useful Tables, a Glossary, and 111 Illustrations, several of which are in colors. Cloth, 80; Interleaved, \$1.25
- GOWERS.** Medical Ophthalmoscopy. A Manual and Atlas with Colored Autotype and Lithographic Plates and Wood-cuts, Comprising Original Illustrations of the Changes of the Eye in Diseases of the Brain, Kidney, etc. 3d Edition. \$4.00
- HARLAN.** Eyesight, and How to Care for It. Illus. .40
- HARTRIDGE.** Refraction. 104 Illustrations and Test Types. 9th Edition, Enlarged. *Just Ready.* \$1.50
- HARTRIDGE.** On the Ophthalmoscope. 3d Edition. With 4 Colored Plates and 68 Wood-cuts. \$1.50
- HANSELL AND REBER.** Muscular Anomalies of the Eye. Illustrated. *Just Ready.* \$1.50
- HANSELL AND BELL.** Clinical Ophthalmology. Colored Plate of Normal Fundus and 120 Illustrations. \$1.50
- JESSOP.** Manual of Ophthalmic Surgery and Medicine. Colored Plates and 108 other Illustrations. *Just Ready.* Cloth, \$3.00
- MORTON.** Refraction of the Eye. Its Diagnosis and the Correction of its Errors. With Chapter on Keratotomy and Test Types. 6th Edition. \$1.00
- OHLEMANN.** Ocular Therapeutics. Authorized Translation, and Edited by DR. CHARLES A. OLIVER. *Just Ready.* \$1.75
- PHILLIPS.** Spectacles and Eyeglasses. Their Prescription and Adjustment. 2d Edition. 49 Illustrations. \$1.00
- SWANZY.** Diseases of the Eye and Their Treatment. 6th Edition, Revised and Enlarged. 158 Illustrations, 1 Plain Plate, and a Zephyr Test Card. \$3.00
- THORINGTON.** Retinoscopy. 3d Edition. Illustrated. \$1.00
- WALKER.** Students' Aid in Ophthalmology. Colored Plate and 40 other Illustrations and Glossary. \$1.50

FEVERS.

- COLLIE.** On Fevers. Their History, Etiology, Diagnosis, Prognosis, and Treatment. Colored Plates. \$2.00
GOODALL AND WASHBOURN. Fevers and Their Treatment. Illustrated. \$3.00

GOUT AND RHEUMATISM.

- DUCKWORTH.** A Treatise on Gout. With Chromo-lithographs and Engravings. Cloth, \$6.00
GARROD. On Rheumatism. A Treatise on Rheumatism and Rheumatic Arthritis. Cloth, \$5.00
HAIG. Causation of Disease by Uric Acid. A Contribution to the Pathology of High Arterial Tension, Headache, Epilepsy, Gout, Rheumatism, Diabetes, Bright's Disease, etc. 4th Edition. \$3.00

HEALTH AND DOMESTIC MEDICINE (see also Hygiene and Nursing).

- BUCKLEY.** The Skin in Health and Disease. Illus. .40
BURNETT. Hearing and How to Keep It. Illustrated. .40
COHEN. The Throat and Voice. Illustrated. .40
DULLES. Emergencies. 4th Edition. Illustrated. \$1.00
HARLAN. Eyesight and How to Care for It. Illustrated. .40
HARTSHORNE. Our Homes. Illustrated. .40
OSGOOD. The Winter and its Dangers. .40
PACKARD. Sea Air and Bathing. .40
PARKES. The Elements of Health. \$1.25
RICHARDSON. Long Life and How to Reach It. .40
WESTLAND. The Wife and Mother. \$1.50
WHITE. The Mouth and Teeth. Illustrated. .40
WILSON. The Summer and its Diseases. .40
WOOD. Brain Work and Overwork. .40
STARR. Hygiene of the Nursery. 5th Edition. \$1.00
CANFIELD. Hygiene of the Sick-Room. \$1.25

HEART.

- SANSOM.** Diseases of the Heart. The Diagnosis and Pathology of Diseases of the Heart and Thoracic Aorta. With Plates and other Illustrations. \$6.00

HISTOLOGY.

- STIRLING.** Outlines of Practical Histology. 368 Illustrations. 2d Edition, Revised and Enlarged. With new Illustrations. \$2.00
STÖHR. Histology and Microscopical Anatomy. Translated and Edited by A. SCHAFFER, M.D., Harvard Medical School. Second Edition, Revised and Enlarged. 292 Illustrations. \$3.00

HYGIENE AND WATER ANALYSIS.

Special Catalogue of Books on Hygiene sent free upon application.

- CANFIELD.** Hygiene of the Sick-Room. A Book for Nurses and Others. Being a Brief Consideration of Asepsis, Antisepsis, Disinfection, Bacteriology, Immunity, Heating, Ventilation, etc. \$1.25
- COPLIN AND BEVAN.** Practical Hygiene. A Complete American Text-Book. 138 Illustrations. New Ed. *Preparing.*
- KENWOOD.** Public Health Laboratory Work. 116 Illustrations and 3 Plates. \$2.00
- LEFFMANN.** Examination of Water for Sanitary and Technical Purposes. 4th Edition. Illustrated. \$1.25
- LEFFMANN.** Analysis of Milk and Milk Products. Illustrated. \$1.25
- LINCOLN.** School and Industrial Hygiene. .40
- MACDONALD.** Microscopical Examinations of Water and Air. 25 Lithographic Plates, Reference Tables, etc. 2d Ed. \$2.50
- MCNEILL.** The Prevention of Epidemics and the Construction and Management of Isolation Hospitals. Numerous Plans and Illustrations. \$3.50
- NOTTER AND FIRTH.** The Theory and Practice of Hygiene. (Being the 9th Edition of Parkes' Practical Hygiene, rewritten and brought up to date.) 10 Plates and 135 other Illustrations. 7034 pages. 8vo. \$7.00
- PARKES.** Hygiene and Public Health. By Louis C. Parkes, M.D. 5th Edition. Enlarged. Illustrated. \$2.50
- PARKES.** Popular Hygiene. The Elements of Health. A Book for Lay Readers. Illustrated. \$1.25
- STARR.** The Hygiene of the Nursery. Including the General Regimen and Feeding of Infants and Children, and the Domestic Management of the Ordinary Emergencies of Early Life, Massage, etc. 6th Edition. 25 Illustrations. \$1.00
- STEVENSON AND MURPHY.** A Treatise on Hygiene. By Various Authors. In Three Octave Volumes. Illustrated. Vol. I, \$6.00; Vol. II, \$6.00; Vol. III, \$5.00
- * * * Each Volume sold separately. Special Circular upon application.
- WILSON.** Hand-Book of Hygiene and Sanitary Science. With Illustrations. 8th Edition. \$3.00
- WEYL.** Sanitary Relations of the Coal-Tar Colors. Authorized Translation by HENRY LEFFMANN, M.D., PH.D. \$1.25
- * * * *Special Catalogue of Books on Hygiene free upon application.*

LUNGS AND PLEURÆ.

- HARRIS AND BEALE.** Treatment of Pulmonary Consumption. \$2.50
- KNOPF.** Pulmonary Tuberculosis. Its Modern Prophylaxis. Illustrated. *Nearly Ready.*
- POWELL.** Diseases of the Lungs and Pleuræ, including Consumption. Colored Plates and other Illus. 4th Ed. \$4.00
- TUSSEY.** High Altitudes in the Treatment of Consumption. \$1.50

MASSAGE.

- KLEEN.** *Hand-Book of Massage.* Authorized translation by MUSSEY HARTWELL, M.D., PH.D. With an Introduction by Dr. S. WEIR MITCHELL. Illustrated by a series of Photographs Made Especially by DR. KLEEN for the American Edition. \$2.25
- MURRELL.** *Massotherapeutics.* Massage as a Mode of Treatment. 6th Edition. *In Press.*
- OSTROM.** *Massage and the Original Swedish Movements.* Their Application to Various Diseases of the Body. A Manual for Students, Nurses, and Physicians. Fourth Edition, Enlarged. 105 Wood Engravings, many of which are original. \$1.00
- WARD.** *Notes on Massage.* Interleaved. Paper cover, \$1.00

MATERIA MEDICA AND THERAPEUTICS.

- ALLEN, HARLAN, HARTE, VAN HARLINGEN.** *A Hand-Book of Local Therapeutics,* Being a Practical Description of all those Agents Used in the Local Treatment of Diseases of the Eye, Ear, Nose and Throat, Mouth, Skin, Vagina, Rectum, etc., such as Ointments, Plasters, Powders, Lotions, Inhalations, Suppositories, Bougies, Tampons, and the Proper Methods of Preparing and Applying Them. Cloth, \$3.00; Sheep, \$4.00
- BIDDLE.** *Materia Medica and Therapeutics.* Including Dose List, Dietary for the Sick, Table of Parasites, and Memoranda of New Remedies. 13th Edition, Thoroughly Revised in accordance with the new U. S. P. 64 Illustrations and a Clinical Index. Cloth, \$4.00; Sheep, \$5.00
- BRACKEN.** *Outlines of Materia Medica and Pharmacology.* \$2.75
- COBLENTZ.** *The Newer Remedies.* 3d Edition, Enlarged and Revised. *Nearly Ready.*
- DAVIS.** *Materia Medica and Prescription Writing.* \$1.50
- FIELD.** *Evacuant Medication.* Cathartics and Emetics. \$1.75
- GORGAS.** *Dental Medicine.* A Manual of Materia Medica and Therapeutics. 6th Edition, Revised. \$4.00
- GROFF.** *Materia Medica for Nurses.* *Just Ready.* \$1.25
- HELLER.** *Essentials of Materia Medica, Pharmacy, and Prescription Writing.* \$1.50
- MAYS.** *Theine in the Treatment of Neuralgia.* ½ bound, .50
- NAPHEYS.** *Modern Therapeutics.* 9th Revised Edition, Enlarged and Improved. In two handsome volumes. Edited by ALLEN J. SMITH, M.D., and J. AUBREY DAVIS, M.D.
Vol. I. General Medicine and Diseases of Children. \$4.00
Vol. II. General Surgery, Obstetrics, and Diseases of Women. \$4.00
- POTTER.** *Hand-Book of Materia Medica, Pharmacy, and Therapeutics,* including the Action of Medicines, Special Therapeutics, Pharmacology, etc., including over 600 Prescriptions and Formulæ. 7th Edition, Revised and Enlarged. With Thumb Index in each copy. *Just Ready.* Cloth, \$5.00; Sheep, \$6.00
- POTTER.** *Compend of Materia Medica, Therapeutics, and Prescription Writing,* with Special Reference to the Physiological Action of Drugs. 6th Revised and Improved Edition, based upon the U. S. P. 1890. .80; Interleaved, \$1.25

- SAYRE. Organic Materia Medica and Pharmacognosy.** An Introduction to the Study of the Vegetable Kingdom and the Vegetable and Animal Drugs. Comprising the Botanical and Physical Characteristics, Source, Constituents, and Pharmacopeial Preparations. With chapters on Synthetic Organic Remedies, Insects Injurious to Drugs, and Pharmacal Botany. A Glossary and 543 Illustrations, many of which are original. 2d Edition. *Preparing.*
- WARING. Practical Therapeutics.** 4th Edition, Revised and Rearranged. Cloth, \$2.00; Leather, \$3.00
- WHITE AND WILCOX. Materia Medica, Pharmacy, Pharmacology, and Therapeutics.** 4th American Edition, Revised by REYNOLD W. WILCOX, M.A., M.D., LL.D. Clo., \$3.00; Lea., \$3.50

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

- REESE. Medical Jurisprudence and Toxicology.** A Text-Book for Medical and Legal Practitioners and Students. 5th Edition. Revised by HENRY LEFFMANN, M.D. Clo., \$3.00; Leather, \$3.50
- "To the student of medical jurisprudence and toxicology it is invaluable, as it is concise, clear, and thorough in every respect."—*The American Journal of the Medical Sciences.*
- MANN. Forensic Medicine and Toxicology.** Illus. \$6.50
- MURRELL. What to Do in Cases of Poisoning.** 8th Edition, Enlarged. \$1.00
- TANNER. Memoranda of Poisons. Their Antidotes and Tests.** 7th Edition. .75

MICROSCOPY.

- BEALE. The Use of the Microscope in Practical Medicine.** For Students and Practitioners, with Full Directions for Examining the Various Secretions, etc., by the Microscope. 4th Ed. 500 Illus. \$6.50
- BEALE. How to Work with the Microscope.** A Complete Manual of Microscopical Manipulation, containing a Full Description of many New Processes of Investigation, with Directions for Examining Objects Under the Highest Powers, and for Taking Photographs of Microscopic Objects. 5th Edition. 400 Illustrations, many of them colored. \$6.50
- CARPENTER. The Microscope and Its Revelations.** 8th Edition. 800 Illustrations and many Lithographs. *Preparing.*
- LEE. The Microtometist's Vade Mecum. A Hand-Book of Methods of Microscopical Anatomy.** 887 Articles. 4th Edition, Enlarged. \$4.00
- MACDONALD. Microscopical Examinations of Water and Air.** 25 Lithographic Plates, Reference Tables, etc. 2d Edition. \$2.50
- REEVES. Medical Microscopy, including Chapters on Bacteriology, Neoplasms, Urinary Examination, etc.** Numerous Illustrations, some of which are printed in colors. \$2.50
- WETHERED. Medical Microscopy. A Guide to the Use of the Microscope in Practical Medicine.** 100 Illustrations. \$2.00

MISCELLANEOUS.

- BLACK.** Micro-Organisms. The Formation of Poisons. A Biological Study of the Germ Theory of Disease. .75
- BURNETT.** Foods and Dietaries. A Manual of Clinical Dietetics. 2d Edition. \$1.50
- BUXTON.** Anæsthetics. Illustrated. 3d Edition. *In Press.*
- GOULD.** Borderland Studies. Miscellaneous Addresses and Essays. 12mo. \$2.00
- GOWERS.** The Dynamics of Life. .75
- HAIG.** Causation of Disease by Uric Acid. A Contribution to the Pathology of High Arterial Tension, Headache, Epilepsy, Gout, Rheumatism, Diabetes, Bright's Disease, etc. 4th Edition. \$3.00
- HAIG.** Diet and Food. Considered in Relation to Strength and Power of Endurance. *Just Ready.* \$1.00
- HARE.** Mediastinal Disease. Illustrated by six Plates. \$2.00
- HEMMETER.** Diseases of the Stomach. Their Special Pathology, Diagnosis, and Treatment. With Sections on Anatomy, Dietetics, Surgery, etc. Illustrated. Clo. \$6.00; Sh. \$7.00
- HENRY.** A Practical Treatise on Anemia. Half Cloth, .50
- LEFFMANN.** The Coal-Tar Colors. With Special Reference to their Injurious Qualities and the Restrictions of their Use. A Translation of THEODORE WEYL'S Monograph. \$1.25
- MARSHALL.** History of Woman's Medical College of Pennsylvania. \$1.50
- NEW SYDENHAM SOCIETY'S PUBLICATIONS.** Circulars upon application. Per Annum, \$8.00
- TREVES.** Physical Education: Its Effects, Methods, Etc. .75
- LIZARS.** The Use and Abuse of Tobacco. .40
- PARRISH.** Alcoholic Inebriety. \$1.00
- ST. CLAIR.** Medical Latin. \$1.00
- SCHREINER.** Diet Lists. Pads of 50. .75
- TURNBULL.** Artificial Anæsthesia. 4th Edition. Illus. \$2.50

NERVOUS DISEASES.

- BEEVOR.** Diseases of the Nervous System and their Treatment. \$2.50
- GORDINIER.** The Gross and Minute Anatomy of the Central Nervous System. With many original Colored and other Illustrations. *Just Ready.* Cloth, \$6.00; Sheep, \$7.00
- GOWERS.** Manual of Diseases of the Nervous System. A Complete Text-Book. Revised, Enlarged, and in many parts Rewritten. With many new Illustrations. Two volumes.
- Vol. I. Diseases of the Nerves and Spinal Cord. 3d Edition, Enlarged. Cloth, \$4.00; Sheep, \$5.00
- Vol. II. Diseases of the Brain and Cranial Nerves; General and Functional Disease. 2d Edition. Cloth, \$4.00; Sheep, \$5.00
- GOWERS.** Syphilis and the Nervous System. \$1.00
- GOWERS.** Diagnosis of Diseases of the Brain. 2d Edition. Illustrated. \$1.50
- GOWERS.** Clinical Lectures. A New Volume of Essays on the Diagnosis, Treatment, etc., of Diseases of the Nervous System. \$2.00
- GOWERS.** Epilepsy and Other Chronic Convulsive Diseases. 2d Edition. *In Press.*

- HORSLEY.** The Brain and Spinal Cord. The Structure and Functions of. Numerous Illustrations. \$2.50
- ORMEROD.** Diseases of the Nervous System. 66 Wood Engravings. \$1.00
- OSLER.** Cerebral Palsies of Children. A Clinical Study. \$2.00
- OSLER.** Chorea and Choreiform Affections. \$2.00
- PRESTON.** Hysteria and Certain Allied Conditions. Their Nature and Treatment. Illustrated. \$2.00
- WATSON.** Concussions. An Experimental Study of Lesions Arising from Severe Concussions. Paper cover, \$1.00
- WOOD.** Brain Work and Overwork. .40

NURSING.

Special Catalogue of Books for Nurses sent free upon application.

- BROWN.** Elementary Physiology for Nurses. .75
- CANFIELD.** Hygiene of the Sick-Room. A Book for Nurses and Others. Being a Brief Consideration of Asepsis, Antisepsis, Disinfection, Bacteriology, Immunity, Heating and Ventilation, and Kindred Subjects for the Use of Nurses and Other Intelligent Women. \$1.25
- CULLINGWORTH.** A Manual of Nursing, Medical and Surgical. 3d Edition with Illustrations. .75
- CULLINGWORTH.** A Manual for Monthly Nurses. 3d Ed. .40
- CUFF.** Lectures to Nurses on Medicine. New Ed. \$1.25
- DOMVILLE.** Manual for Nurses and Others Engaged in Attending the Sick. 8th Edition. With Recipes for Sick-room Cookery, etc. .75
- FULLERTON.** Obstetric Nursing. 41 Ills. 5th Ed. \$1.00
- FULLERTON.** Nursing in Abdominal Surgery and Diseases of Women. Comprising the Regular Course of Instruction at the Training-School of the Women's Hospital, Philadelphia. 2d Edition. 70 Illustrations. \$1.50
- GROFF.** Materia Medica for Nurses. With Questions for Self-Examination and a very complete Glossary. *Just Ready.* \$1.25
- HUMPHREY.** A Manual for Nurses. Including General Anatomy and Physiology, Management of the Sick Room, etc. 16th Ed. Illustrated. \$1.00
- SHAWE.** Notes for Visiting Nurses, and all those Interested in the Working and Organization of District, Visiting, or Parochial Nurse Societies. With an Appendix Explaining the Organization and Working of Various Visiting and District Nurse Societies, by HELEN C. JENKS, of Philadelphia. \$1.00
- STARR.** The Hygiene of the Nursery. Including the General Regimen and Feeding of Infants and Children, and the Domestic Management of the Ordinary Emergencies of Early Life, Massage, etc. 6th Edition. 25 Illustrations. \$1.00
- TEMPERATURE AND CLINICAL CHARTS.** See page 6.
- VOSWINKEL.** Surgical Nursing. Second Edition, Enlarged. 112 Illustrations. *Just Ready.* \$1.00
- WARD.** Notes on Massage. Interleaved. Paper cover, \$1.00

OBSTETRICS.

- BAR.** Antiseptic Midwifery. The Principles of Antiseptic Methods Applied to Obstetric Practice. Authorized Translation by HENRY D. FRY, M.D., with an Appendix by the Author. \$1.00

- CAZEAUX AND TARNIER.** Midwifery. With Appendix by MUNDÉ. The Theory and Practice of Obstetrics, including the Diseases of Pregnancy and Parturition, Obstetrical Operations, etc. 8th Edition. Illustrated by Chromo-Lithographs, Lithographs, and other full-page Plates, seven of which are beautifully colored, and numerous Wood Engravings. Cloth, \$4.50; Full Leather, \$5.50
- DAVIS.** A Manual of Obstetrics. Being a Complete Manual for Physicians and Students. 3d Enlarged and Revised Edition. With Colored and many other Illustrations. *In Press*
- LANDIS.** Compend of Obstetrics. 6th Edition, Revised by Wm. H. WELLS, Assistant Demonstrator of Clinical Obstetrics, Jefferson Medical College. With 47 Illustrations, .80; Interleaved, \$1.25
- SCHULTZE.** Obstetrical Diagrams. Being a series of 20 Colored Lithograph Charts, Imperial Map Size, of Pregnancy and Midwifery, with accompanying explanatory (German) text illustrated by Wood Cuts. 2d Revised Edition.
Price in Sheets, \$26.00; Mounted on Rollers, Muslin Backs, \$36.00
- STRAHAN.** Extra-Uterine Pregnancy. The Diagnosis and Treatment of Extra-Uterine Pregnancy. .75
- WINCKEL.** Text-Book of Obstetrics, Including the Pathology and Therapeutics of the Puerperal State. Authorized Translation by J. CLIFTON EDGAR, A.M., M.D. With nearly 200 Illustrations. Cloth, \$5.00; Leather, \$6.00
- FULLERTON.** Obstetric Nursing. 5th Ed. Illustrated. \$1.00

PATHOLOGY.

- BARLOW.** General Pathology. 795 pages. 8vo. \$5.00
- BLACKBURN.** Autopsies. A Manual of Autopsies Designed for the Use of Hospitals for the Insane and other Public Institutions. Ten full-page Plates and other Illustrations. \$1.25
- BLODGETT.** Dental Pathology. By ALBERT N. BLODGETT, M.D., late Professor of Pathology and Therapeutics, Boston Dental College. 33 Illustrations. \$1.25
- COPLIN.** Manual of Pathology. Including Bacteriology, Technic of Post-Mortems, Methods of Pathologic Research, etc. 265 Illustrations, many of which are original. 12mo. \$3.00
- GILLIAM.** Pathology. A Hand-Book for Students. 47 Illus. .75
- HALL.** Compend of General Pathology and Morbid Anatomy. 91 very fine Illustrations. 2d Edition. .80; Interleaved, \$1.25
- HEWLETT.** Manual of Bacteriology. 75 Illustrations. \$3.00
- VIRCHOW.** Post-Mortem Examinations. A Description and Explanation of the Method of Performing Them in the Dead House of the Berlin Charity Hospital, with Special Reference to Medicolegal Practice. 3d Edition, with Additions. .75
- WHITACRE.** Laboratory Text-Book of Pathology. With 121 Illustrations. \$1.50
- WILLIAMS.** Bacteriology. A Manual for Students. 78 Illustrations. *Just Ready.* \$1.50

PHARMACY.

- Special Catalogue of Books on Pharmacy sent free upon application.*
- COBLENTZ.** The Newer Remedies. Including their Synonyms, Sources, Methods of Preparation, Tests, Solubilities, and Doses as far as known. Together with Sections on the Organo-Therapeutic Agents and Indifferent Compounds of Iron. Third Edition, very much Enlarged. *Just Ready.* \$1.00
- COBLENTZ.** Manual of Pharmacy. A New and Complete Text-Book by the Professor in the New York College of Pharmacy. 2d Edition, Revised and Enlarged. 437 Illus. Cloth, \$3.50; Sh., \$4.50

- BEASLEY.** *Book of 3100 Prescriptions.* Collected from the Practice of the Most Eminent Physicians and Surgeons—English, French, and American. A Compendious History of the Materia Medica, Lists of the Doses of all the Official and Established Preparations, an Index of Diseases and their Remedies. 7th Ed. \$2.00
- BEASLEY.** *Druggists' General Receipt Book.* Comprising a Copious Veterinary Formulary, Recipes in Patent and Proprietary Medicines, Druggists' Nostrums, etc.; Perfumery and Cosmetics, Beverages, Dietetic Articles and Condiments, Trade Chemicals, Scientific Processes, and many Useful Tables. 10th Ed. \$2.00
- BEASLEY.** *Pharmaceutical Formulary.* A Synopsis of the British, French, German, and United States Pharmacopœias. Comprising Standard and Approved Formulæ for the Preparations and Compounds Employed in Medicine. 12th Edition. *Just Ready.* \$2.00
- PROCTOR.** *Practical Pharmacy.* Lectures on Practical Pharmacy. With Wood Engravings and 32 Lithographic Fac-simile Prescriptions. 3d Edition, Revised, and with Elaborate Tables of Chemical Solubilities, etc. \$3.00
- ROBINSON.** *Latin Grammar of Pharmacy and Medicine.* 3d Edition. With elaborate Vocabularies. \$1.75
- SAYRE.** *Organic Materia Medica and Pharmacognosy.* An Introduction to the Study of the Vegetable Kingdom and the Vegetable and Animal Drugs. Comprising the Botanical and Physical Characteristics, Source, Constituents, and Pharmacopœial Preparations. With Chapters on Synthetic Organic Remedies, Insects Injurious to Drugs, and Pharmacal Botany. A Glossary and 543 Illustrations. Second Edition. *Preparing.*
- SCOVILLE.** *The Art of Compounding.* Second Edition, Revised and Enlarged. Cloth, \$2.50; Sheep, \$3.50
- STEWART.** *Compend of Pharmacy.* Based upon "Remington's Text-Book of Pharmacy." 5th Edition, Revised in Accordance with the U. S. Pharmacopœia, 1890. Complete Tables of Metric and English Weights and Measures. .80; Interleaved, \$1.25
- UNITED STATES PHARMACOPŒIA.** 1890. 7th Decennial Revision. Cloth, \$2.50 (postpaid, \$2.77); Sheep, \$3.00 (postpaid, \$3.27); Interleaved, \$4.00 (postpaid, \$4.50); Printed on one side of page only, unbound, \$3.50 (postpaid, \$3.90).
- Select Tables from the U. S. P. (1890).* Being Nine of the Most Important and Useful Tables, Printed on Separate Sheets. Carefully put up in patent envelope. .25
- POTTER.** *Hand-Book of Materia Medica, Pharmacy, and Therapeutics.* 600 Prescriptions. 7th Ed. Clo., \$5.00; Sh., \$6.00
- * * * *Special Catalogue of Books on Pharmacy free upon application.*

PHYSICAL DIAGNOSIS.

- BROWN.** *Medical Diagnosis.* A Manual of Clinical Methods. 4th Ed. 112 Illustrations. *Just Ready.* Cloth, \$2.25
- FENWICK.** *Medical Diagnosis.* 8th Edition. Rewritten and very much Enlarged. 135 Illustrations. Cloth, \$2.50
- MEMMINGER.** *Diagnosis by the Urine.* 2d Ed. 24 Illus. \$1 00
- TYSON.** *Hand-Book of Physical Diagnosis.* For Students and Physicians. By the Professor of Clinical Medicine in the University of Pennsylvania. Illus. 3d Ed., Improved and Enlarged. With Colored and other Illustrations. *Just Ready.* \$1.50

PHYSIOLOGY.

- BRUBAKER.** Compend of Physiology. 9th Edition, Revised and Enlarged. Illustrated. *Just Ready.* .80; Interleaved, \$1.25
- KIRKE.** Physiology. (15th Authorized Edition. Dark-Red Cloth.) A Hand-Book of Physiology. 15th Edition, Revised, Rearranged, and Enlarged. By PROF. W. D. HALLIBURTON, of Kings College, London. 661 Illustrations, some of which are printed in colors. *Just Ready.* Cloth, \$3.00; Leather, \$3.75
- LANDOIS.** A Text-Book of Human Physiology, Including Histology and Microscopical Anatomy, with Special Reference to the Requirements of Practical Medicine. 5th American, translated from the 9th German Edition, with Additions by WM. STIRLING, M.D., D.SC. 845 Illus., many of which are printed in colors. *In Press.*
- STARLING.** Elements of Human Physiology. 100 Ills. \$1.00
- STIRLING.** Outlines of Practical Physiology. Including Chemical and Experimental Physiology, with Special Reference to Practical Medicine. 3d Edition. 289 Illustrations. \$2.00
- TYSON.** Cell Doctrine. Its History and Present State. \$1.50
- YEO.** Manual of Physiology. A Text-Book for Students of Medicine. By GERALD F. YEO, M.D., F.R.C.S. 3d Edition. 254 Illustrations and a Glossary. Cloth, \$2.50; Leather, \$3.00

PRACTICE.

- BEALE.** On Slight Ailments; their Nature and Treatment. 2d Edition, Enlarged and Illustrated. \$1.25
- FOWLER.** Dictionary of Practical Medicine. By various writers. An Encyclopædia of Medicine. Clo., \$3.00; Half Mor. \$4.00
- HUGHES.** Compend of the Practice of Medicine. 6th Edition, Revised and Enlarged.
- Part I. Continued, Eruptive, and Periodical Fevers, Diseases of the Stomach, Intestines, Peritoneum, Biliary Passages, Liver, Kidneys, etc., and General Diseases, etc.
- Part II. Diseases of the Respiratory System, Circulatory System, and Nervous System; Diseases of the Blood, etc.
- Price of each part, .80; Interleaved, \$1.25
- Physician's Edition.** In one volume, including the above two parts, a Section on Skin Diseases, and an Index. 6th Revised, Enlarged Edition. 568 pp. Full Morocco, Gilt Edge, \$2.25
- ROBERTS.** The Theory and Practice of Medicine. The Sections on Treatment are especially exhaustive. 9th Edition, with Illustrations. Cloth, \$4.50; Leather, \$5.50
- TAYLOR.** Practice of Medicine. 5th Edition. Cloth, \$4.00
- TYSON.** The Practice of Medicine. By JAMES TYSON, M.D., Professor of Clinical Medicine in the University of Pennsylvania. A Complete Systematic Text-book with Special Reference to Diagnosis and Treatment. Illustrated. 8vo. Cloth, \$5.50; Leather, \$6.50; Half Russia, \$7.50

PRESCRIPTION BOOKS.

- BEASLEY.** Book of 3100 Prescriptions. Collected from the Practice of the Most Eminent Physicians and Surgeons—English, French, and American. A Compendious History of the Materia Medica, Lists of the Doses of all Official and Established Preparations, and an Index of Diseases and their Remedies. 7th Ed. \$2.00

- BEASLEY. Druggists' General Receipt Book.** Comprising a Copious Veterinary Formulary, Recipes in Patent and Proprietary Medicines, Druggists' Nostrums, etc.; Perfumery and Cosmetics, Beverages, Dietetic Articles and Condiments, Trade Chemicals, Scientific Processes, and an Appendix of Useful Tables. 10th Edition, Revised. \$2.00
- BEASLEY. Pocket Formulary.** A Synopsis of the British, French, German, and United States Pharmacopœias and the chief unofficial Formularies. 12th Edition. *Just Ready.* \$2.00

SKIN.

- BULKLEY. The Skin in Health and Disease.** Illustrated. .40
- CROCKER. Diseases of the Skin.** Their Description, Pathology, Diagnosis, and Treatment, with Special Reference to the Skin Eruptions of Children. 92 Illus. 3d Edition. *Preparing.*
- IMPEY. Leprosy.** 37 Plates. 8vo. \$3.50
- SCHAMBERG. Diseases of the Skin.** 99 Illustrations. Being No. 16? Quiz-Compend? Series. Cloth, .80; Interleaved, \$1.25
- VAN HARLINGEN. On Skin Diseases.** A Practical Manual of Diagnosis and Treatment, with special reference to Differential Diagnosis. 3d Edition, Revised and Enlarged. With Formulæ and 60 Illustrations, some of which are printed in colors. \$2.75

SURGERY AND SURGICAL DISEASES (see also Urinary Organs).

- CRIPPS. Ovariectomy and Abdominal Surgery.** Illus. \$8.00
- DEAVER. Surgical Anatomy.** A Treatise on Human Anatomy in its Application to Medicine and Surgery. With about 400 very Handsome full-page Illustrations Engraved from Original Drawings made by special Artists from Dissections prepared for the purpose. Three Volumes. Royal Square Octavo. Cloth, \$21.00; Half Morocco or Sheep, \$24.00; Half Russia, \$27.00
- DEAVER. Appendicitis, Its Symptoms, Diagnosis, Pathology, Treatment, and Complications.** Elaborately Illustrated with Colored Plates and other Illustrations. Cloth, \$3.50
- DULLES. What to Do First in Accidents and Poisoning.** 5th Edition. New Illustrations. \$1.00
- HACKER. Antiseptic Treatment of Wounds,** According to the Method in Use at Professor Billroth's Clinic, Vienna. .50
- HAMILTON. Lectures on Tumors, from a Clinical Standpoint.** Third Edition, Revised, with New Illustrations. \$1.25
- HEATH. Minor Surgery and Bandaging.** 10th Ed., Revised and Enlarged. 158 Illustrations, 62 Formulæ, Diet List, etc. \$1.25
- HEATH. Injuries and Diseases of the Jaws.** 4th Edition. 187 Illustrations. \$4.50
- HEATH. Lectures on Certain Diseases of the Jaws.** 64 Illustrations. Boards, .50
- HORWITZ. Compend of Surgery and Bandaging,** including Minor Surgery, Amputations, Fractures, Dislocations, Surgical Diseases, and the Latest Antiseptic Rules, etc., with Differential Diagnosis and Treatment. 5th Edition, very much Enlarged and Rearranged. 167 Illustrations, 98 Formulæ. Clo., .80; Interleaved, \$1.25

- JACOBSON.** Operations of Surgery. Over 200 Illustrations.
Cloth, \$3.00; Leather, \$4.00
- JACOBSON.** Diseases of the Male Organs of Generation.
88 Illustrations. \$6.00
- LANE.** Surgery of the Head and Neck. 110 Illustrations.
2d Edition. *Just Ready.* \$5.00
- MACREADY.** A Treatise on Ruptures. 24 Full-page Litho-
graphed Plates and Numerous Wood Engravings. Cloth, \$6.00
- MAYLARD.** Surgery of the Alimentary Canal. 134 Illus. \$7.50
- MOULLIN.** Text-Book of Surgery. With Special Reference to
Treatment. 3d American Edition. Revised and edited by JOHN B.
HAMILTON, M.D., LL.D., Professor of the Principles of Surgery and
Clinical Surgery, Rush Medical College, Chicago. 623 Illustrations,
over 200 of which are original, and many of which are printed in
colors. Handsome Cloth, \$6.00; Leather, \$7.00
- “The aim to make this valuable treatise practical by giving special
attention to questions of treatment has been admirably carried out.
Many a reader will consult the work with a feeling of satisfaction that
his wants have been understood, and that they have been intelligently
met.”—*The American Journal of Medical Science.*
- ROBERTS.** Fractures of the Radius. A Clinical and Patho-
logical Study. 33 Illustrations. \$1.00
- SMITH.** Abdominal Surgery. Being a Systematic Description of
all the Principal Operations. 224 Illus. 6th Ed. 2 Vols. Clo., \$10.00
- SWAIN.** Surgical Emergencies. Fifth Edition. Cloth, \$1.75
- VOSWINKEL.** Surgical Nursing. Second Edition, Revised and
Enlarged. 111 Illustrations. *Just Ready.* \$1.00
- WALSHAM.** Manual of Practical Surgery. 6th Ed., Re-
vised and Enlarged. With 410 Engravings. \$3.00
- WATSON.** On Amputations of the Extremities and Their
Complications. 250 Illustrations. \$5.50

THROAT AND NOSE (see also Ear).

- COHEN.** The Throat and Voice. Illustrated. .40
- HALL.** Diseases of the Nose and Throat. Two Colored
Plates and 59 Illustrations. \$2.50
- HOLLOPETER.** Hay Fever. Its Successful Treatment. \$1.00
- HUTCHINSON.** The Nose and Throat. Including the Nose,
Naso-Pharynx, Pharynx, and Larynx. Illustrated by Lithograph
Plates and 40 other Illustrations. 2d Edition. *In Press.*
- MACKENZIE.** Pharmacopœia of the London Hospital for
Dis. of the Throat. 5th Ed., Revised by Dr. F. G. HARVEY. \$1.00
- McBRIDE.** Diseases of the Throat, Nose, and Ear. A Clinical
Manual. With colored Illus. from original drawings. 2d Ed. \$6.00
- POTTER.** Speech and its Defects. Considered Physiologically,
Pathologically, and Remedially. \$1.00

URINE AND URINARY ORGANS.

- ACTON.** The Functions and Disorders of the Reproductive
Organs in Childhood, Youth, Adult Age, and Advanced Life,
Considered in their Physiological, Social, and Moral Relations.
8th Edition. \$1.75

- ALLEN. Albuminous and Diabetic Urine. Illus. \$2.25
 BEALE. One Hundred Urinary Deposits. On eight sheets, for the Hospital, Laboratory, or Surgery. Paper, \$2.00
 HOLLAND. The Urine, the Gastric Contents, the Common Poisons, and the Milk. Memoranda, Chemical and Microscopical, for Laboratory Use. Illustrated and Interleaved. 5th Ed. \$1.00
 JACOBSON. Diseases of the Male Organs of Generation. 88 Illustrations \$6.00
 MEMMINGER. Diagnosis by the Urine. 2d Ed. 24 Illus. \$1.00
 MORRIS. Renal Surgery, with Special Reference to Stone in the Kidney and Ureter and to the Surgical Treatment of Calculous Anuria. Illustrated. \$2.00
 MOULLIN. Enlargement of the Prostate. Its Treatment and Radical Cure. 2d Edition. Illustrated. *In Press.*
 MOULLIN. Inflammation of the Bladder and Urinary Fever. Octavo. *Just Ready.* \$1.50
 THOMPSON. Diseases of the Urinary Organs. 8th Ed. \$3.00
 TYSON. Guide to Examination of the Urine. For the Use of Physicians and Students. With Colored Plate and Numerous Illustrations engraved on wood. 9th Edition, Revised. \$1.25
 VAN NUYS. Chemical Analysis of Healthy and Diseased Urine, Qualitative and Quantitative. 39 Illustrations. \$1.00

VENEREAL DISEASES.

- COOPER. Syphilis. 2d Edition, Enlarged and Illustrated with 20 full-page Plates. \$5.00
 GOWERS. Syphilis and the Nervous System. 1.00

VETERINARY.

- ARMATAGE. The Veterinarian's Pocket Remembrancer. Being Concise Directions for the Treatment of Urgent or Rare Cases, Embracing Semeiology, Diagnosis, Prognosis, Surgery, Treatment, etc. 2d Edition. Boards, \$1.00
 BALLOU. Veterinary Anatomy and Physiology. 29 Graphic Illustrations. .80; Interleaved, \$1.25
 TUSON. Veterinary Pharmacopœia. Including the Outlines of Materia Medica and Therapeutics. 5th Edition. \$2.25

WOMEN, DISEASES OF.

- BYFORD (H. T.). Manual of Gynecology. Second Edition, Revised and Enlarged by 100 pages. With 341 Illustrations, many of which are from original drawings. \$3.00
 BYFORD (W. H.). Diseases of Women. 4th Edition. 306 Illustrations. Cloth, \$2.00
 DÜHRSSSEN. A Manual of Gynecological Practice. 105 Illustrations. \$1.50
 LEWERS. Diseases of Women. 146 Illus. 5th Ed. \$2.50
 WELLS. Compend of Gynecology. Illustrated. .80; Interleaved, \$1.25
 FULLERTON. Nursing in Abdominal Surgery and Diseases of Women. 2d Edition. 70 Illustrations. \$1.50

COMPENDS.

From The Southern Clinic.

"We know of no series of books issued by any house that so fully meets our approval as these ?Quiz-Compendis?. They are well arranged, full, and concise, and are really the best line of text-books that could be found for either student or practitioner."

BLAKISTON'S ?QUIZ-COMPENDS?

The Best Series of Manuals for the Use of Students.

Price of each, Cloth, .80. Interleaved, for taking Notes, \$1.25.

☞ These Compendis are based on the most popular text-books and the lectures of prominent professors, and are kept constantly revised, so that they may thoroughly represent the present state of the subjects upon which they treat.

☞ The authors have had large experience as Quiz-Masters and attaches of colleges, and are well acquainted with the wants of students.

☞ They are arranged in the most approved form, thorough and concise, containing over 600 fine illustrations, inserted wherever they could be used to advantage.

☞ Can be used by students of *any* college.

☞ They contain information nowhere else collected in such a condensed, practical shape. Illustrated Circular free.

No. 1. POTTER. HUMAN ANATOMY. Sixth Revised and Enlarged Edition. Including Visceral Anatomy. Can be used with either Morris's or Gray's Anatomy. 117 Illustrations and 16 Lithographic Plates of Nerves and Arteries, with Explanatory Tables, etc. By SAMUEL O. L. POTTER, M.D., Professor of the Practice of Medicine, Cooper Medical College, San Francisco; late A. A. Surgeon, U. S. Army.

No. 2. HUGHES. PRACTICE OF MEDICINE. Part I. Sixth Edition, Enlarged and Improved. By DANIEL E. HUGHES, M.D., Physician-in-Chief, Philadelphia Hospital, late Demonstrator of Clinical Medicine, Jefferson Medical College, Phila.

No. 3. HUGHES. PRACTICE OF MEDICINE. Part II. Sixth Edition, Revised and Improved. Same author as No. 2.

No. 4. BRUBAKER. PHYSIOLOGY. Ninth Edition, with new Illustrations and a table of Physiological Constants. Enlarged and Revised. By A. P. BRUBAKER, M.D., Professor of Physiology and General Pathology in the Pennsylvania College of Dental Surgery; Adjunct Professor of Physiology, Jefferson Medical College, Philadelphia, etc.

No. 5. LANDIS. OBSTETRICS. Sixth Edition. By HENRY G. LANDIS, M.D. Revised and Edited by WM. H. WELLS, M.D., Instructor of Obstetrics, Jefferson Medical College, Philadelphia. Enlarged. 47 Illustrations.

No. 6. POTTER. MATERIA MEDICA, THERAPEUTICS, AND PRESCRIPTION WRITING. Sixth Revised Edition (U. S. P. 1890). By SAMUEL O. L. POTTER, M.D., Professor of Practice, Cooper Medical College, San Francisco; late A. A. Surgeon, U. S. Army.

? QUIZ-COMPENDS ?—Continued.

- No. 7. WELLS. GYNECOLOGY.** By WM. H. WELLS, M.D., Instructor of Obstetrics, Jefferson College, Philadelphia. 150 Illustrations.
- No. 8. GOULD AND PYLE. DISEASES OF THE EYE AND REFRACTION.** A New Book. Including Treatment and Surgery, and a Section on Local Therapeutics. By GEORGE M. GOULD, M.D., and W. L. PYLE, M.D. With Formulæ, Glossary, Tables, and 111 Illustrations, several of which are Colored.
- No. 9. HORWITZ. SURGERY, Minor Surgery, and Bandaging.** Fifth Edition, Enlarged and Improved. By ORVILLE HORWITZ, B. S., M.D., Clinical Professor of Genito-Urinary Surgery and Venereal Diseases in Jefferson Medical College; Surgeon to Philadelphia Hospital, etc. With 98 Formulæ and 71 Illustrations.
- No. 10. LEFFMANN. MEDICAL CHEMISTRY.** Fourth Edition. Including Urinalysis, Animal Chemistry, Chemistry of Milk, Blood, Tissues, the Secretions, etc. By HENRY LEFFMANN, M.D., Professor of Chemistry in Pennsylvania College of Dental Surgery and in the Woman's Medical College, Philadelphia.
- No. 11. STEWART. PHARMACY.** Fifth Edition. Based upon Prof. Remington's Text-Book of Pharmacy. By F. E. STEWART, M.D., PH.G., late Quiz-Master in Pharmacy and Chemistry, Philadelphia College of Pharmacy; Lecturer at Jefferson Medical College. Carefully revised in accordance with the new U. S. P.
- No. 12. BALLOU. VETERINARY ANATOMY AND PHYSIOLOGY.** Illustrated. By WM. R. BALLOU, M.D., Professor of Equine Anatomy at New York College of Veterinary Surgeons; Physician to Bellevue Dispensary, etc. 29 graphic Illustrations.
- No. 13. WARREN. DENTAL PATHOLOGY AND DENTAL MEDICINE.** Third Edition, Illustrated. Containing a Section on Emergencies. By GEO. W. WARREN, D.D.S., Chief of Clinical Staff, Pennsylvania College of Dental Surgery.
- No. 14. HATFIELD. DISEASES OF CHILDREN.** Second Edition. Colored Plate. By MARCUS P. HATFIELD, Professor of Diseases of Children, Chicago Medical College.
- No. 15. HALL. GENERAL PATHOLOGY AND MORBID ANATOMY.** 91 Illustrations. By H. NEWBERRY HALL, PH.G., M.D., late Professor of Pathology, Chicago Post-Graduate Medical School. Second Edition.
- No. 16. DISEASES OF THE SKIN.** By JAY T. SCHAMBERG, M.D., Instructor in Skin Diseases, Philadelphia Polyclinic. With 99 handsome Illustrations.

Price, each, Cloth, .80.

Interleaved, for taking Notes, \$1.25.

In preparing, revising, and improving BLAKISTON'S ? QUIZ-COMPENDS ? the particular wants of the student have always been kept in mind.

Careful attention has been given to the construction of each sentence, and while the books will be found to contain an immense amount of knowledge in small space, they will likewise be found easy reading; there is no stilted repetition of words; the style is clear, lucid, and distinct. The arrangement of subjects is systematic and thorough; there is a reason for every word. They contain over 600 illustrations.

Morris' Anatomy

Second Edition,
Revised and Enlarged.

790 Illustrations, of which many
are in Colors.

Royal Octavo. Cloth, \$6.00; Sheep, \$7.00;
Half Russia, \$8.00.

From The Medical Record, New York.

“The reproach that the English language can boast of no treatise on anatomy deserving to be ranked with the masterly works of Henle, Luschka, Hyrtl, and others, is fast losing its force. During the past few years several works of great merit have appeared, and among these Morris’s “Anatomy” seems destined to take first place in disputing the palm in anatomical fields with the German classics. The nomenclature, arrangement, and entire general character resemble strongly those of the above-mentioned handbooks, while in the beauty and profuseness of its illustrations it surpasses them. . . . The ever-growing popularity of the book with teachers and students is an index of its value, and it may safely be recommended to all interested.”

****Handsome Descriptive Circular, with
Sample Pages and Colored Illustrations,
will be sent free upon application.**

NATIONAL LIBRARY OF MEDICINE



NLM 00044900 9