

tritis, 1729 +). In 1521 was published at Madrid the "Examen Apothecariorum," composed in 1497 by Pedro Benedicto Mateo, which has been found by Mal-laina to be a veritable pharmacopœia. The first national pharmacopœia ("Ph. Hispana") appeared in 1794. This and the next three editions, viz., of 1798, 1803, and 1817, were written in Latin. The fifth (1865) and sixth editions (1884) are in Spanish with Latin synonyms of the titles. The "Farmacopœia Oficial Española" appears to have made the least progress of any. Even the last edition, here and there, betrays an adherence to unscientific, empirical, or obsolete remedies and methods. Besides, it bears internal evidence of the influence of the new French Codex. In the number of articles, of which it contains nearly one thousand seven hundred, it is only exceeded by the last-mentioned work.

Attempts have been made to prepare a separate pharmacopœia for Cuba, but no tangible results have been reached thus far.

Sweden.—A. "Ph. Holmiensis" was published at Stockholm in 1686. The first work, bearing the title "Ph. Suecica," appeared in 1705, but without special authority. The first official pharmacopœia appeared in 1775, and the succeeding editions in 1779 (ii.); 1784 (iii.); 1790 (iv.); 1817 (v.); in this edition the chemical portion was edited by Berzelius, and the botanical and zoological by Swartz; it was the most advanced and perfect pharmacopœia of its time; 1845 (vi.), and 1869 (vii., with supplement of 1879). The last edition has been several times reprinted with amendments. It has much resemblance to the Danish and Norwegian (see under Denmark). The text is in Latin, and the number of titles is six hundred and seventy-seven.

Switzerland.—A "Ph. Helveticorum" was published at Geneva in 1677. In 1684 there appeared in the same city an edition of Charas' "Pharmacopœia Regia Galenica et Chymica," which was followed as authority for a long time. The Basle Medical Society, in 1771, published a "Ph. Helvetica" (containing an introduction by A. de Haller). A "Ph. Genevensis" appeared in 1780, and was reprinted several times afterward. In 1852 an elaborate draft of a pharmacopœia for the Canton of Berne was published at Berne under the title "Pharmacopœia Bernensis Tentamen." This may be regarded as the precursor of the "Ph. Helvetica," published in 1865 at Schaffhausen, by the Swiss Pharmaceutical Society. The latter work has been recognized by law in most of the cantons, but not in all. A second edition appeared in 1872, and a large supplement in 1876.

The text of this pharmacopœia is in Latin, and has much in common with the German Pharmacopœia. A new work, "Pharmacopœia Helvetica, Editio III.," was issued in 1893.

The Canton of Tessin has a pharmacopœia of its own, published in 1848. Geneva uses the French Codex.

Turkey.—The Imperial Medical School at Constantinople has directed the use of the French Codex. Other foreign pharmacopœias, however, are also in use.

Uruguay.—The French and Spanish pharmacopœias are chiefly in use.

Venezuela.—The French and Spanish pharmacopœias are mostly in use. Long since, the medical faculty at Caracas took initiatory steps to prepare a national pharmacopœia, without result so far.

Revised by
Charles Rice,
Henry H. Rusby.

PHARMACOPŒIA, UNITED STATES.—HISTORY.—The first pharmacopœia in the United States was published at Philadelphia, for the use of the Military Hospital of the United States army, located at Lititz, Lancaster County, Pa., in 1778, under the title, "Pharmacopœia simpliciorum et efficaciorum in usum nosocomii militaris ad exercitum federatarum Americę civitatum pertinentis; hodiernę nostrę inopię rerumque angustii, feroci hostium sevitię, belloque crudeli ex inopinato patrię nostrę illato debitis, maxime accommodata" ("Pharmacopœia of the more simple and efficacious [preparations] for the

use of the Military Hospital of the Army of the United States of America; specially adapted to our present poverty and distress, due to the ferocious cruelty of the enemy and to the bloody war unexpectedly brought upon our fatherland"). Only one copy of this edition is known to exist, which is in the surgeon-general's office at Washington. Of a second edition, there appears to be likewise only one copy known (see *Am. Jour. Pharm.*, 1884, 483). This was issued in 1781. Upon the title page appears the name of Dr. William Brown, as author. It is entirely in Latin, in thirty-two pages. It contains eighty-four internal and sixteen external remedies. Previous to the year 1820, various European pharmacopœias, chiefly those of London, Edinburgh, and Dublin, were used in the United States, though the want of a national pharmacopœia was, to some extent, filled by Cox's "American Dispensatory" (first edition, Philadelphia, 1806 +), and Thacher's "American New Dispensatory" (first edition, Boston, 1810 +). In 1808 the "Pharmacopœia of the Massachusetts Medical Society" was published at Boston, and in 1816 the "Pharmacopœia of the New York Hospital" at New York. The first impetus to a national pharmacopœia was given in 1817, by Dr. Lyman Spaulding, in a plan laid before the Medical Society of the County of New York. (For details of the history of the "Pharmacopœia of the United States of America," consult the latter work, sixth edition, New York, 1882, pp. v.-xiii.). The first convention for the formation of a national pharmacopœia assembled at Washington on January 1st, 1820, at which time the several drafts previously prepared by the several district conventions were consolidated and revised. The finished work was published at Boston, on December 15th, 1820, both in Latin and in English. A second edition appeared in 1828. Before adjourning, the convention provided for a future revision of the work, by arranging for the call of a convention in 1830. Owing to a misunderstanding, however, two separate conventions were held in this year, one meeting at New York, and the other at Washington, and two separate pharmacopœias resulted from this, one being published at New York in 1830, the other at Philadelphia in 1831. Fortunately, the bodies who had met at New York subsequently abandoned the plan of continuing a separate revision in the future, and in 1840 the third general convention assembled again at Washington. The Committee of Revision appointed at this convention was authorized to request the co-operation of the colleges of pharmacy, and this resulted in the contribution of much valuable material. The new revision was published in 1842, the text being for the first time only in English, the Latin being restricted to the titles and synonyms. At the next convention, in 1850, the incorporated colleges of pharmacy were for the first time invited to participate in the deliberations. Previous to this, only incorporated medical societies had been invited to send delegates. The fourth edition of the work appeared in 1851, and a second edition of this in 1855. The next two conventions met at the appointed time, in 1860 and 1870, and the fifth and sixth editions of the pharmacopœia were issued in 1863 and 1873, respectively. Several years before the next succeeding convention (in 1880), a very lively interest was awakened in the proposed new revision of the work, and several plans were advanced, looking toward a radical change in the manner of revising and controlling the revision of the pharmacopœia. A large amount of preliminary work was also bestowed, principally on the part of the American Pharmaceutical Association, upon the plan and contents of the next edition. The convention which assembled at Washington, in 1880, was the most representative of any that had so far been held, and after a general plan of revision had been adopted, a Committee of Revision and Publication was appointed, consisting of twenty-five members, residing in various parts of the United States. This committee has made a detailed report of its proceedings in the preface to its work, which appeared toward the end of 1882 (see "United States Pharmacopœia," 1882, pp. xxvii.-xxxiii.). The title page designates this as

the "Sixth Decennial Revision"; consequently, this was the seventh edition of the work. In this revision radical changes were made, the intention being to render the work as independent of commentaries as was possible. The arrangement was alphabetical throughout, all crude drugs and chemicals being defined and accompanied by descriptions or by tests of identity and purity. Actual weights and measures were replaced by a system of parts by weight, except in the case of fluid extracts. Many obsolete articles were dropped, and many new ones admitted, the total number of accepted titles being nine hundred and ninety-seven. The general verdict of all competent critics, both at home and abroad, was that this was one of the best pharmacopœias ever issued, and that it did not suffer by comparison with works that appeared later.

It having been long felt that the pharmacopœia contains a considerable number of preparations which are not frequently prescribed, and are retained only in order that, if called for, their uniform composition may be insured, the American Pharmaceutical Association undertook the compilation of a "National Formulary of Unofficial Preparations," primarily designed to establish uniform formulas for any compound used in legitimate pharmacy or prescribed by physicians, and for which there is no recognized official standard. It was believed that this formulary might eventually be made the repository of all such pharmacopœia articles as are no longer deemed of sufficient importance to be included in the official list. This work was published in 1888, under the above title, and has proved very useful. In May, 1890, the Decennial Convention for Revising the Pharmacopœia met at Washington, and resulted in the election of a committee of revision, consisting of twenty-six members, located in different sections of the country, and gave instructions for the "Seventh Decennial Revision, or the Eighth Edition," which was published by the committee itself, and went into effect on January 1st, 1894. The most important features introduced into this work were the substitution of the metric system of weights and measures for "parts by weight"; the reference of the standardizing of preparations by chemical assay, and of such assay processes to the discretion of the committee, the committee subsequently deciding upon the adoption of such standards for only a few drugs and preparations; volumetric methods were made to replace, as far as possible, gravimetric methods; articles protected by proprietary rights were excluded; important changes in chemical nomenclature and notation were adopted, though radical measures were rejected; in botanical nomenclature the Rochester code was adopted as authoritative; ninety articles were dropped and eighty-eight were added; the word *official* was adopted to replace "official." This work was received universally as representing the most advanced, yet sufficiently conservative standard among pharmacopœias, and the advances in it have so far commended themselves to the medical and pharmaceutical professions during the decade since its appearance, that further progress in the same directions has been generally urged, particularly in that of an extension of the list of assayed drugs and preparations. It may be safely said that the Pharmacopœia of 1890 has done more than any of its predecessors for general pharmaceutical education, and to only a lesser degree for medical education. At the present time (January 1st, 1903), the work of the Eighth Decennial Revision is nearly completed. Soon after the meeting of the convention of 1900, death removed the beloved and highly talented chairman of the revision committee, Dr. Charles Rice, and Prof. Joseph P. Remington was elected as his successor. The interest in this revision, throughout the country, has been general and hearty, and the committee has worked with the greatest enthusiasm. Of the many important changes in the pending publication some are fairly radical. The work of revision and that of publication have been assigned to distinct bodies; the former to a committee of twenty-five members, as before, the latter to a board of trustees, a regular incorporation

having been effected for this purpose. Among the special features of this revision the following are worthy of note: Whenever possible, articles are to be standardized on the basis of chemical assay; physiological standards may also be represented in the requirements for anti-toxin, notwithstanding the instructions of the convention to the contrary, the committee having decided that the importance of the subject demands even so dangerous a precedent as this; although the descriptions of crude drugs are to retain, so far as is consistent with clearness and accuracy, the simple language of the preceding edition, yet simple descriptive terms are to be introduced, wherever necessary, to facilitate the detection of elements of adulteration entering into powdered drugs; a wonderful advance over the instructions of 1880, which forbade the introduction of any characters which could not be seen with a lens magnifying "about ten diameters"; doses are to be specified, and, finally, the revolutionary principle has been accepted that proprietary rights of limited duration in a meritorious drug, provided that the conditions render it amenable to standardization and resulting control, do not constitute an objection to its recognition by the Pharmacopœia, and a sub-committee has been appointed to determine what proprietary articles can properly be admitted under this rule.

Authority of the Pharmacopœia.—The authority of a pharmacopœia may be legal or professional, and may be established either before the existence of the work, by the legal or professional appointment of its compilers, or thereafter, through its adoption by a government or by a representative professional body. In either case it occupies a special office, and all matters pertaining to it are therefore denominated *official*, or, according to older usage, "official." Thus we have official and unofficial drugs, medicines, reagents, and other substances, as well as official titles, synonyms, definitions, descriptions, tests, formulas, processes, doses, etc. The professional authority of the Pharmacopœia is not compulsory, except as a violation of such of its provisions as have professional sanction involves professional disrepute. Its legal authority, established by statutes, with penalty attached, is of course so. In this way the United States Pharmacopœia has been made the legal authority in many States, as well as wherever the jurisdiction of the national Government extends.

Objects and Scope of the Pharmacopœia.—In the definition given under *Pharmacopœia*, it is stated that the standards named apply to the "medicines used in the practice of medicine"; not merely to those whose merits justify them to such use. The object of the book is to provide a means of assuring the user of a drug or medicine that he shall receive that for which he calls. The right of each individual to such assurance, regardless of whether his selection of the article is well advised, is obvious, and constitutes the chief basis of procedure in the preparation of the book. The selection of the articles to be made official is thus based upon the fact of their common use. Since very many worthless or very inferior articles are in common use by physicians as well as among the laity, the recognition of such in the Pharmacopœia is thus called for. On the other hand, many valuable drugs are brought forward without ever attracting much attention or coming into general use, so that the mere fact that the compilers of a pharmacopœia believe a new drug to possess merit does not justify them in recognizing it. Such a drug must first establish at least a probability of coming into general use before it shall receive recognition. From the above, it follows that "the recognition of a drug by the Pharmacopœia is not evidence, *prima facie*, that it possesses merit, nor the absence of such recognition that it does not." It also follows that the Pharmacopœia is not to be regarded as a guide to the practitioner in the selection of his remedies, but rather as an index to the general conditions of practice in such respect and as an authority for testing the genuineness of the articles treated by it. A knowledge of the merits of the articles, and an ability to make a judicious selection, are supposed to be gained from a

study of text-books and other literature relating to therapeutics. It may be added that experience in the United States has repeatedly demonstrated the fact that the introduction of an article to the Pharmacopœia has very little weight by itself in extending its use.

In spite of these general facts, however, the compilers of our Pharmacopœia do recognize a certain responsibility for favoring the worthier articles; so that at their periodical revisions they are disposed to employ a liberal construction of the above guiding principles and to lean toward the expurgation of the more worthless articles and the introduction of meritorious ones whenever the conditions will possibly justify them.

There is another class of important articles which many physicians, even among the more intelligent, see with surprise to be denied a recognition in the Pharmacopœia, notwithstanding that such denial is a natural necessity; such articles, namely, as are, for one reason or another, not subject to any official definition, description, or standardization. Of this class the most conspicuous examples are found among copyrighted articles. In these cases it is the names alone which are copyrighted and which have a fixed identity. Absolute ownership of these names is conferred by the copyright, and there is no stipulation as to the use which is to be made of them, except that they shall be arbitrary, that is, not descriptive of the article to which they are applied. They may be meaningless, or they may be devised with the object of misleading the public, as by naming the syrup of a well-known fruit, whereas, if such were the real origin of the preparation, its name would be descriptive and would at once lose the copyright protection. Furthermore, the substance to which the name is applied may be changed or substituted at the will of the owner of the name and as often as he desires. Manifestly, control and standardization by a pharmacopœia of an article so named is an impossibility. The case is quite different with those articles which are protected by patents of limited duration, either upon the product itself or upon the process by which it is prepared. Such protection provides for publicity and freedom at the end of the patent period. Ethical views regarding such protection have of late undergone a very great change. Here, as in many other parts of the medical field, rationalism has replaced blind and arbitrary ruling, and the *cui bono* standard has come to be applied, with the result, as stated below, that certain important, not to say absolutely necessary drugs which enjoy limited protection are to be recognized in the forthcoming edition of our Pharmacopœia.

Official Names and Definitions.—The official Latin and English titles call for little discussion. They constitute, like other names, a basis for specifying the respective articles, and their use in preference to that of any other names by which the articles may be known, enables the prescriber to secure the support of official, and in many cases of legal authority, which he might find it difficult to obtain if he used an unofficial title, subject to different applications in different localities, and perhaps even in professional literature. In special cases, when the latter condition exists so as to involve special danger of misunderstanding, the Pharmacopœia may also recognize one or more synonyms.

The official definition is intended to be a full statement of what constitutes the article named by the title, and at the same time limits it by the exclusion of all else. In the case of pure chemicals or pure substances of natural origin, as alkaloids and glucosides, the chemical formula usually constitutes a complete definition. If the article is not required or expected to be absolutely pure, a statement of the allowable amount, and perhaps of the nature, of the impurity frequently forms a part of the definition. In the case of animals or plants or their parts, the definition states clearly what part or parts shall be employed. The terms used in naming such plants and parts are those authoritatively employed in zoology and botany. In cases in which zoological or botanical authority is divided, as in the rules of botanical nomenclature, the compilers

decide which method and rules shall be employed, and a statement to that effect is incorporated into the introduction of the book. The family or natural group to which the animal or plant pertains is also named in the definition. This is, strictly speaking, superfluous to a definition, but proves convenient and instructive.

When the living part is to be taken or collected in some particular stage or condition, as "in full bloom," "in the second year of its growth," "when full grown," "fully ripe," etc., this fact also is stated in the definition, as is any change which is to be made in it in preservation or preparation, as "the dried root," "a prepared exudation," "an inspissated juice," a bark "kept one year before being used," or "not kept longer than one year," etc. In special cases, a note may be appended to a definition specifying some danger to which the article is peculiarly liable, and stating how the same may be avoided. In a few cases, when the facts regarding the origin of an article are unknown, as in the case of the root of an unknown species of Smilax, or when the number of species yielding the article is indefinite or inconveniently large for specification, the definition cannot be made fully to accomplish its purposes. The best possible must then be done with it and the description must be relied upon, to accomplish the remainder.

Official Standards.—The standards of the Pharmacopœia are physical, chemical, and physiological, and are incorporated into the descriptions.

The description, in other cases than those referred to above, is not to be regarded as partaking of the same nature as the definition, but as a statement of the tests which are to be applied by one having the article in hand, for the purpose of employing the specified standard. These standards and tests may be qualitative or quantitative. The ordinary physical test is included in the description of the drug as regards color, surface, and other external appearances, hardness, weight, fracture, structure, odor, and taste. Chemical standards, qualitative or quantitative, do not differ from those ordinarily employed in chemistry. Physiological tests are by many regarded as excluded by the general nature and uses of a pharmacopœia. Nevertheless, many of the physical tests, such as peculiar effects upon the nose or tongue, the pupil and other organs, may fairly be denominated as physiological and the extension of this class of standards in the pharmacopœia in the future is to be anticipated.

Preparations.—Among the several preparations to which drugs are subject the Pharmacopœia makes a selection, in each individual case, based upon the nature of the article, on both pharmaceutical and therapeutical grounds, and these preparations are enumerated just after the description. In those cases in which a small amount of the drug enters into some other article or preparation merely as an adjuvant, and not especially for its own medicinal effect, such article or preparation is not regarded as a preparation of that drug and is not thus named. Proximate principles, such as alkaloids, glucosides, fixed and volatile oils, also, are not treated as preparations. There are a number of instances in which neither pharmaceutical nor therapeutical considerations can determine a selection, and here no preparation is specified, though opinions are not wanting to the effect that at least one official preparation ought to be supplied for every official drug. The preparations thus named are then treated, in the regular alphabetical order of their titles, as official articles, their formulas and methods of preparation being given in full detail and in some cases definite standards being supplied, similar to those above described for the drugs themselves. The question has been much mooted as to whether a preparation can be considered to be official if, made strictly in accordance with the formula and of a quality fully equal to that resulting from the official process of manufacture, it differs merely in some variation from the latter. The question is a delicate and not unimportant one. It is urged upon the one hand that the principal object of prescribing an official process is to insure the quality of the preparation, and that if departures from it be permitted, a tendency

to laxity may be encouraged. Upon the other hand, it is clear that in large manufacturing operations the methods of the retail pharmacist are impracticable, and even that a better result may be otherwise attained. The view of this subject, which has always been taken, at least in modern times by the revisers themselves, is that a deviation from the process is permissible, provided that a satisfactory preparation is insured.

Doses.—The United States Pharmacopœia has never heretofore been willing to assume the responsibility involved, or which might be involved in particular cases, by the adoption of doses. The possibility that the prescribed dose might in individual cases act disastrously, and that the compilers of the Pharmacopœia might be held responsible for having authorized it, has always acted deterrently. At length, however, a method has been devised by which, according to the highest legal advice, a system of official dosage can be adopted which will be free from this danger. Doses are therefore to be introduced into the forthcoming edition, although their exact limitations have not yet been made public.

The Appendix.—The Appendix of the Pharmacopœia containing lists, definitions, descriptions of reagents, tables of atomic weight, thermometric equivalents, alcohols, acids, and other important chemicals, of saturation, equivalents of the English and metric systems of weights and measures, is of great importance, possessing an authoritative value for accuracy and a facility for reference which, without any regard to the subject matter found in the body of the work, entitles the latter to a convenient position upon the shelf or table, not only of every physician and pharmacist, but of every person whose work brings him into contact in any way with physical or chemical science.

Use of the Pharmacopœia.—The use of the Pharmacopœia by pharmacists is incomparably greater than that by physicians, and to this fact is in great part due the higher degree of accuracy and care and the more definite knowledge of the former profession regarding the materia medica. Not only is this true, but it is undeniable that the most serious shortcomings of the medical profession in matters therapeutical might be largely eliminated were they to rely more fully upon reference to this work. While it is true that the Pharmacopœia provides no information directly concerning therapeutics, yet it contains very full information, and of the most reliable character, concerning materia medica, fundamental to therapeutics and, in turn, the highest teachings of therapeutics constitute its basis as to preparations and dosage, and as to a majority of the drugs treated.

Henry H. Rusby.

PHARMACOPŒIAS, GENERAL AND INTERNATIONAL.—Many works have been published, which are designed to comprise the text of all, or at least the most prominent pharmacopœias. Among the earlier authors of such works are Lemery, Charas, Spielmann, Swediaur, Quincy, Brugnatelli, etc. Of more recent works the following deserve special mention: A. J. Jourdan, "Ph. Universelle" (Paris, 1828, second, ed. 1840); P. L. Geiger, "Ph. Universalis" (Heidelberg, 1835-45); B. Hirsch, "Universal-Pharmakopœie" (Leipzig, 1885, vol. i.).

Many years ago efforts began to be made to bring about greater harmony in the different pharmacopœias, and the proposition was finally made to inaugurate an International Pharmacopœia. Opinions differed greatly for a long time, not only as to whether the plan was feasible at all, but also in regard to details. Steps were finally taken to have a draft of the work prepared, but national jealousy on several occasions rendered its acceptance impossible. It was not to be expected that each civilized nation would abandon its own pharmacopœia, specially adapted to the habits of its own people and its own domestic resources, for one elaborated without regard to such considerations, and possibly introducing unfamiliar preparations or changing the strength of such as were in common use. The utmost that could be expected was that the different nations, whenever revising

their own pharmacopœias, would gradually approximate such preparations as were regarded worthy of international regulation to the proposed standard. Another hope which was expressed was this, that the International Pharmacopœia might be used and followed as an independent work in different countries in this way, that prescribers would designate preparations contained in it in their prescriptions. A plan has been presented for the establishment of a common pharmacopœia for the American continent. This is too wide a scope to be feasible at present. But it is feasible to prepare a pharmacopœia for all the Spanish-speaking countries in Central and South America, provided all political differences are waived for the sake of the benefit which may accrue from the result. After some uniformity has been reached in Central and South America, it remains to be seen how much further it can be carried. At the International Pharmaceutical Congress, held at Brussels in 1886, the draft of an international pharmacopœia was presented by the president of the International Commission, Baron A. von Waldheim, of Vienna. Yet, in its preparation the other members of the commission had not been sufficiently consulted, and the draft was not accepted. Other meetings of this Congress have been held since, the seventh taking place at the close of the meeting of the American Pharmaceutical Association in Chicago in 1893. At this time what may be regarded as the first practical step toward reaching an international agreement was taken when the American Pharmaceutical Association appropriated \$1,000 toward defraying the expense of preparing and publishing an international pharmacopœia, to be confined to the treatment of potent remedies. In 1897 the Congress met again at Brussels, but did not approve of this proposition for a restricted pharmacopœia, and again indorsed the idea of a large and comprehensive work. In the mean time, no steps have been taken toward carrying out that plan, and the less visionary representatives, led by the American and British contingents, have gone ahead with the initial steps in the direction of preparing a work treating of potent remedies. A report on this subject has been submitted to representative bodies in the different countries, and there seems to be some prospect that important results may follow.

Instead of attempting the almost impossible, the advocates of uniformity in medicines appear to be willing to bring about the desired end by natural means, that is, by first causing the consolidation of the pharmacopœias of contiguous countries, particularly those in which the same language is spoken. Thus, Germany has long ago displaced the host of local pharmacopœias in existence previous to the establishment of the empire by a single national work. Italy has done the same. The Scandinavian countries also contemplate doing this. It is easy to foresee that there never will be an international pharmacopœia which will replace each individual national one. The best that can be hoped for is a work containing the description, definition, requirements of purity and strength of what may be called international remedies, single or compound, and even this cannot be introduced without risking danger from the administration of preparations the strength of which as contained in the international pharmacopœia differs from that prescribed in the national pharmacopœia of the dispenser.

Charles Rice.
Revised by Henry H. Rusby.

UNIVERSAL PHARMACOPŒIA.—In this place should be mentioned the work by Dr. Bruno Hirsch, of Berlin, entitled, "Universal-Pharmakopœie. Eine vergleichende Zusammenstellung der zur Zeit in Europa und Nordamerika gültigen Pharmakopœien" (Universal Pharmacopœia. A Comparative Digest of the Pharmacopœias in force at the present time in Europe and in the United States). This work contains practically the whole text of the several pharmacopœias (except that of Portugal) in such a way that the similarities and differences of the requirements of the several texts are shown at a glance

in connection with each subdivision of an article. It is a work of reference indispensable for every revision committee in this and other countries for many years to come.
Charles Rice.

PHARYNX, ANATOMY OF. See *Tonsils, etc.*

PHARYNX, DISEASES OF: ACUTE INFLAMMATIONS.—In the text-books, generally, the use of the term pharyngitis is somewhat confusing, as tonsillitis, uvulitis, and palatal inflammation, as well as inflammation of the pharynx proper, are loosely included in the term. While in nearly all inflammations of the pharynx the contiguous structures anteriorly are involved, yet, as diseases of these structures are considered elsewhere in this work, the term pharyngitis, as here used, will be definitely limited to inflammations of the pharynx proper, except in treating of the throat complications of the acute fevers.

SIMPLE ACUTE PHARYNGITIS.—Acute inflammation of the pharynx is usually accompanied by inflammation of other portions of the upper respiratory tract, and there is commonly more or less nasal occlusion. Acute inflammation, not septic or traumatic, strictly limited to the pharynx, is very rare.

Etiology.—As a rule the acute disease is either the lighting up of a subacute inflammation or an extension of acute nasopharyngitis. As etiological factors may be mentioned: bad air, poor food, sedentary habits, alcoholic intemperance, excessive use of tobacco, and in general anything that tends to lower the vitality. Digestive disorders, nasal obstruction, sudden atmospheric changes, influenza, and tonsillitis are frequent causes. Heredity plays an important part, and rheumatism and gout are sometimes factors. As traumatic causes may be noted, irritant poisons, flame, hot water, steam, foreign bodies.

Pathology.—There are hyperæmia and congestion of the blood-vessels in the submucosa, with pressure on the mucous glands and lessening mucous secretion during the first stage. In the second stage, congestion is somewhat relieved and the secretion is poured out, the tenacity of the latter depending on the amount of fibrin present. If the amount of fibrin be very great, there is formed a false membrane which is non-infectious.

Symptoms.—The attack is usually sudden and is ushered in by a feeling of malaise and chilliness rather than a distinct chill. The temperature rarely goes beyond 101°–102° F. The digestive system is usually deranged, the appetite is lost, the bowels are constipated, the tongue is furred, and the breath is foul. Pain in the muscles of the neck and back is common; there is generally headache and often there is aching of the joints. At first there is dryness of the throat and the surface of the mucous membrane is shiny and smooth. Later, the secretion becomes abundant and the membrane thickened and rough from hypertrophy of the lymphoid follicles. The voice becomes thick and husky and there is fatigue on talking, even when there is no apparent involvement of the larynx. In the attempt to get rid of the mucus the patient hawks and hems rather than coughs, while the dryness, or later the thickening, causes frequent efforts at swallowing. The feeling at first is as though there was a hair in the throat; later, it is that of a larger foreign body. Pain is a constant symptom, being increased by the efforts at swallowing. When the group of follicles just back of the posterior pillar is much involved, pain referred to the ear is usual, being conveyed through Eustachian involvement or by means of the glossopharyngeal or Jacobson's nerve. The sense of taste may be decidedly obtunded, especially if the lingual tonsil is involved; but this symptom is rather an accompaniment of nasal obstruction. The color of the mucous membrane varies from pink to dark red, and the superficial blood-vessels show much enlargement. The attack may be limited to one side, but it is nearly always bilateral.

Prognosis.—This is favorable, but at the same time the disease manifests a strong tendency to become chronic, by reason of the continuance of the exciting causes and

the impossibility of putting the organ at rest. The duration varies from three or four days to two weeks, according to the severity of the attack and the general health of the patient.

Treatment.—This should begin with a saline cathartic, preferably preceded by one or two grains of calomel in trituration. Tincture of aconite in one-minim doses hourly seems to have a special action in pharyngeal inflammation; but, if the pain is considerable, phenacetin, five to eight grains every three or four hours, or Dover's powder, may be given. If there be a rheumatic diathesis, the salicylate of strontium, five grains every three hours, will prove of value, while in tonsillar complications salol, five grains every four hours, or salipyryn, ten grains at like intervals, will be better.

Quinine is recommended, but it is most likely to be of service when the tonsillar involvement suggests mild sepsis. In the early stage cold externally by wet compresses or a cold coil will give relief; later, heat will be more agreeable. A four- to six-per-cent. solution of nitrate of silver brushed lightly over the pharynx is useful, but one of the newer albuminous silver compounds, as protargol in ten-per-cent. spray, will be less irritating and just as good. Lennox Browne pronounces guaiacol—fifty per cent. in sweet almond oil, used with brush or spray—to be the best of all local applications. This burns sharply, but is followed by an anæsthetic effect. While gargles do not reach much of the posterior wall of the pharynx they do reach the contiguous parts, and any one who has personally used a gargle knows the comfort which follows its use. If a patient does not know how to gargle it is not well to rely on the method, as in such cases it is nothing more than a mouth wash. The best gargles are on the order of the Dobell solution, used hot. If carbolic acid is disagreeable, it may be omitted and the solution made up with equal parts of cinnamon water and peppermint water. In the early stage a spray of mentholated benzoïnol, from two to four grains of menthol to the ounce, may be more agreeable than a watery application. Later, a gargle or spray of tincture of chloride of iron will hasten recovery.

Demulcents in the form of lozenges are often grateful. They may contain menthol in minute dose combined with guaiacum or eucalyptol.

Shurly recommends, for the mitigation of local distress, a tablet of biniodide of mercury (gr. $\frac{1}{10}$ to gr. $\frac{1}{8}$) to be held in the mouth till dissolved, the dose being repeated every two or three hours till five or six have been taken. In the second stage, if the secretion continues profuse for too long a period, atropine or aconitine, gr. $\frac{1}{1000}$ to gr. $\frac{1}{500}$ every two or three hours, will hasten recovery. Steam inhalations are generally worse than useless, although sometimes temporarily soothing in the earliest stage.

GANGRENOUS ACUTE INFLAMMATION OF THE PHARYNX.—This disease is ordinarily classed under infective or phlegmonous pharyngitis, the severer forms being accompanied by sloughing. Including all forms under this title, one writer will give the prognosis in infective pharyngitis as very grave, while another, limiting the term to the milder cases, will state that the prognosis is uniformly favorable. The gangrenous form of infective pharyngitis is very likely to arise from localization of the infecting germ in typhoid, diphtheria, scarlet fever, and other infectious diseases. In such cases the infecting material probably reaches the point of localization through the blood instead of from absorption through the mucous membrane, as seems to be the case in the milder, more superficial forms in which the streptococcus is the infecting germ. The prognosis is very grave, both from the severity of the local process and from the development of septicæmia. Treatment is directed chiefly to the systemic infection, elimination being encouraged and stimulants given. Locally, mild antiseptic solutions are of most use.

GOUTY PHARYNGITIS.—This occurs as a manifestation of the general disease, but may appear quite independently of involvement of other parts.

Lermoyez and Gasne give the following diagnostic

data: (1) Sudden onset, acute evolution, and sudden disappearance. (2) Sharp febrile symptoms, depression. (3) Very acute pain, out of proportion to the local appearances. (4) Tendency of inflammation to diffuse itself over the pharynx and spread toward the larynx, ordinary quinsy being more localized. (5) Dark red and œdematous appearance of pillars of fauces, uvula elongated, and posterior wall of pharynx swollen. (6) Absence of exudation. (7) The glands at the angle of the jaw not involved. Colchicum is to be used in the treatment of such cases. Locally, soothing gargles, or preferably sprays, are indicated.

HERPETIC PHARYNGITIS.—(Synonyms: Common membranous sore throat; Aphthous sore throat; Benign croupous angina.) Herpes of the throat, which is a milder disease than the skin affection, appears as a discrete eruption, the individual spots measuring 6–8 mm. in diameter and being located on the posterior wall of the pharynx or anterior surface of the faucial pillars. The etiology is varied. The local manifestation is probably due to a peripheral degeneration of the nerves of the affected area. The general condition has a very considerable etiological significance, disorders of the alimentary tract and many febrile diseases acting as causes.

The earliest symptoms are dryness of the throat and pain of a burning or stinging character. The constitutional symptoms are as a rule slight, fever if present being of mild grade. The eruption may be unilateral or bilateral. The vesicular stage is seldom observed, the vesicles rupturing early and the excoriated mucous membrane becoming covered with a thin, soft membrane which is easily wiped off. Labial herpes is usually also present. The disease lasts for from eight to sixteen days, but has a very considerable tendency to recur. Diagnosis is made from other membranous anginas by the mildness of the symptoms, the labial herpes, and the thinness and superficial character of the membrane.

Little local treatment is necessary; bland sprays or gargles, and applications of silver nitrate (two or three grains to the ounce), or of resorcin (ten grains to the ounce of glycerin) will be found useful. If pain is considerable orthoform may be used.

MEMBRANOUS PHARYNGITIS.—Non-diphtheritic membranous pharyngitis, the term being limited to cases in which an actual pseudomembrane develops on the pharynx,—whether or not the tonsils and palate be also involved,—is a very rare disease. In nearly all individuals there is a well-developed strip of glandular tissue lying just back of the posterior faucial pillar. In ordinary lacunar tonsillitis it is quite common to find this follicular area involved in the exudative process. The exudation from the several follicles in the strip may coalesce and give the appearance of a narrow membranous strip on either side of the pharynx. This condition, which is frequently spoken of as a membranous sore throat, is properly only an acute exudative follicular pharyngitis. Kyle describes a membranous pharyngitis: "An acute infectious process in which there forms on the mucous membrane surface a highly coagulable albuminoid material which constitutes a false membrane and occurs along with desquamation of the superficial epithelium." Such a condition must be very rare.

Emil Mayer in 1900 described a case due to Friedländer's bacillus, and was able to collect thirteen of the same kind from the literature. In measles there is sometimes developed in the pharynx a streptococcal membrane which resembles very closely the membrane that is formed in diphtheria; its presence constitutes a grave complication.

The diagnosis of membranous pharyngitis is not always easy. Localized areas of epithelial necrosis, or herpetic pharyngitis after the vesicles have ruptured, cannot be distinguished by the naked eye from false membrane. This frequently leads to mistakes in diagnosis, and the terms herpetic pharyngitis and membranous pharyngitis are frequently used synonymously. The greatest care is needed in differentiating this condition from diphtheria, and it is commonly accepted that any case of membranous

sore throat is to be treated as diphtheria until a diagnosis is positively reached.

The prognosis is generally favorable except in the streptococcal variety, in which the outlook is more serious.

Treatment.—The systemic treatment should be the same as for diphtheria in the severer varieties. Locally, disinfectants and detergents are indicated. A spray of pyrozone, hydrozone, or any high-class hydrogen peroxide solution is of value. The ordinary commercial solutions of hydrogen peroxide are sometimes very irritating to the throat and should never be used. Löffler's toluol solution is also effective. It should be applied with a swab, and care should be taken to squeeze out the excess.

PEMPHIGUS.—Cases of pemphigus of the pharynx are occasionally reported. The bullæ are rarely seen before rupture. The acute disease is attended by headache, pain, and fever. The duration is from one to three weeks, but there is a strong tendency to recur and become chronic, especially in the aged. The disease is differentiated from diphtheria by the bacteriology, the easy removal of the exudate, the absence of glandular enlargement, and the mildness of the constitutional symptoms. Adhesions are very likely to form and should be carefully guarded against. The treatment is about the same as for herpes.

RHEUMATIC PHARYNGITIS.—Rheumatism of the pharynx is occasionally observed, but perhaps not so often as the descriptions would ordinarily lead one to believe. It is claimed that extensive ulceration of the pharynx may result directly from rheumatism. The diagnosis is made from the history of the patient; from the sharp pain, especially on swallowing, which is out of proportion to the redness of the mucous membrane, and varies in severity as a rule several times in the twenty-four hours; and from the prompt relief afforded by the salicylates. The local treatment should consist of hot gargles, together with the external use of a chloral liniment or a twenty-five-per-cent. ointment of ichthyol.

TRAUMATIC PHARYNGITIS.—This is an acute inflammation of the pharynx due to wounds, foreign bodies, caustics, and the inhalation of dust or vapors. Children are especially liable owing to their frequent mistakes in swallowing hot or caustic fluids. Persons working in dust or in caustic vapors are also liable to pharyngitis of this type. Any foreign body that may become lodged in the throat or may lacerate the mucous membrane as it passes through the pharynx may give rise to inflammation with œdema and at times abscess formation. In any traumatic pharyngitis there is danger of the inflammation and œdema extending to the glottis with fatal results. In the aged or enfeebled the irritation caused by the swallowing of a bit of crust or a small piece of eggshell, or any such material, may give rise to fatal inflammation.

Treatment.—In the case of a foreign body, if it be still present, prompt removal should be effected through the natural passages if possible; if not, by external pharyngotomy. Often, however, it is found that the offending body has been removed or swallowed, and that only the effects are to be combated. Soothing applications should be made—oily sprays containing from three to six grains of menthol to the ounce, Dobell's solution, and adrenalin chloride, 1 to 4,000, to be repeated every two hours or oftener. Bland fluids only should be swallowed, all solid foods being avoided. If œdema threaten, scarification should be done to a sufficient extent to afford relief.

URTICARIA OF THE PHARYNX.—Urticaria may make its appearance in the pharynx either after or before its occurrence on the skin, but always in conjunction therewith. Those cases of supposed urticaria localizing themselves in the pharynx are probably cases of angioneurotic œdema (which see).

The causes of pharyngeal urticaria are naturally those of the affection in general, e.g., shellfish, small fruits, stings of insects, drugs (copaiba, cubebs, quinine, capsicum, turpentine), the neurotic, rheumatic, and gouty states, genital disorders, pregnancy, constipation, etc. There is a form of acute febrile urticaria which develops suddenly and usually appears at the same time on the