

the following kinds of work here summarized are actually carried out by pharmacognosists at the present time:

1. The collection of crude drugs and other raw materials from both living kingdoms.
2. The cultivation of drug, spice and oil plants.
3. The identification of crude drugs, spices, commercial gums, resins, paper and textile fibers, woods and other raw materials from plants and animals together with their adulterants and substitutes.
4. The garbling, grading, shipping and curing of crude drugs, condiments and other raw materials.
5. The valuation of crude drugs, spices, and other products obtained from plants and animals, involving organoleptic, physical, chemical, microchemical, microsublimation and pharmacodynamic tests, as well as histological examination.
6. The preservation of these raw materials of vegetable and animal origin from the ravages of insects, mites, molds, bacteria, yeasts and other organisms, as well as the influence of temperature, moisture and light.
7. Inquiry into the history, geographical distribution, trade routes and commercial sources of these natural products of plants and animals.

A definition embracing all of these practices involved in the modern practice of pharmacognosy might read as follows:

Pharmacognosy is the science which treats of the history, distribution, commerce, collection, cultivation, identification, selection, valuation and preservation of crude drugs and other organic materials of vegetable and animal origin, indeed a wide field and basic to the practice of pharmacy.

Accordingly, pharmacognosy would not be synonymous with *materia medica*, for the latter, being the study of all medicinal materials, not only includes the crude drug phases of pharmacognosy, but in addition the mineral drugs, the refined products of crude drugs, the medicinal synthetics and preparations of all of these. Nor would it be synonymous with pharmacology in either the broad or restricted use of the latter term, for in its broadest use pharmacology embraces every kind of inquiry into drugs and other remedial agents, while in its more restricted use it deals with the action of drugs upon living organisms.

MATERIA MEDICA—HOW DEFINED?

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It appears that during the past half century there has been considerable confusion regarding the meaning and proper use of the term "*Materia Medica*." It has been confused with Pharmacognosy, Pharmacology and even Chemistry and has been frequently used synonymously with those terms and especially the first two.

According to Murray, "*A New English Dictionary*," this term was used by Galen (131–200 A.D.) in a generic sense, to mean "medical material," *i. e.*, the remedial substances used in the practice of medicine. As a science it was considered that branch of medical science which treats of these substances. At that time

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remedial substances were largely derived from plants and it may be that this is the basis for the later use of this term as a synonym for Pharmacognosy.

With the organization of medical schools it appears that this term was adopted to designate that branch of medical science which dealt with the nature and properties of all the substances employed for the cure of disease. When Pharmacy became a separate branch of medicine and schools of pharmacy were organized, this term was apparently adopted and used in a similar sense.

In the early days of medical schools and of schools of pharmacy there were fewer subjects in the curricula and there was not the high degree of specialization that exists under modern conditions. With the development of specialization many of the broad and widely inclusive terms used to designate subjects of the curricula were subdivided and replaced by terms indicating branches of science narrower in scope and more definite in nature and content of subject matter. Hence, we now have such terms as pharmacology, therapeutics, toxicology, posology, pharmacodynamics and pharmacognosy, which appear to be subdivisions of the old "Materia Medica." However, that there is a considerable difference of opinion and consequent confusion as to which of these is the broader and parent term is evident from the following definitions taken from textbooks, dictionaries and encyclopedias.

Wood, Geo. B.—"Therapeutics and Pharmacology," vol. I (1856).

Pharmacology, or the science of *Materia Medica*, treats of medicines in all their relations; *Therapeutics*, of remedies in general, and their application to the cure or alleviation of disease.

Wood, H. C., Jr.—"A Treatise on Therapeutics Comprising Materia Medica and Toxicology," 3rd ed., 1880.

"Pharmacology" is the general term employed to embrace these three divisions—

Pharmacy—science of preparing medicines.

Therapeutics—application of medicines to the cure of disease.

Materia Medica—(basis for both of these studies) a knowledge of the substances used as medicines.

Maisch—"Manual of Organic Materia Medica," 7th ed., 1899.

The primary object of *Pharmacognosy* or *Materia Medica* is to enable us to recognize drugs, to determine their quality, to detect their adulteration and to distinguish the characteristic elements of those which are closely allied.

Bastedo, W. A.—"Materia Medica, Pharmacology and Therapeutics," 2nd ed., 1922.

Materia Medica—drug remedies are known collectively as the "materia medica," or medical materials. The science which deals with the properties of drugs is called materia medica or, more correctly, pharmacology. It is a term that is employed in a broad sense to include everything relating to drugs.

The fields are:

1. *Pharmacognosy*—the study of the physical properties of crude drugs.
2. *Pharmacy*—the art of preparing drugs for use.
3. *Pharmaceutic chemistry*.
4. *Pharmacodynamics* or *Pharmacology* (in its restricted sense).

Cushny's—"Pharmacology and Therapeutics," 9th ed., 1928.

Materia Medica—comprised an examination of the botanical and chemical properties of drugs along with some account of the diseases in which they had proved of value.

A term used up to the middle of the nineteenth century.

This descriptive rather than experimental study has been continued under the name of *Pharmacognosy* but is now pursued by pharmacists chiefly.

Culbreth—"Materia Medica and Pharmacology," 7th ed., 1927.

"*Materia Medica* (Medical Material)—is a treatise upon the materials, agents, or appliances used in medicine—including their name, source (origin) habitat, family, (natural order—organic) physical characteristics, methods by which obtained, tests for purity and adulterations, constituents (composition), forms of administration (preparations), physiological action (properties), uses (therapeutics—therapy), normal and lethal doses, antagonists, incompatibilities, synergists (organic and inorganic), and other important features."

Subdivided:

1. *Pharmacy*—comprising the art of preparing drugs in suitable forms for dispensing, administering or applying. . . .

2. *Pharmacognosy*—comprising the study of physical and chemical characters of drugs—the knowledge of selecting, recognizing and identifying true and false specimens by such characteristics.

3. *Pharmacodynamics*—comprising the knowledge of physiological action.

4. *Toxicology*—comprising the effect, nature and detection of drugs when given in poisonous doses—the treatment and antidote for same.

5. *Therapeutics*—comprising the intelligent application or use of agents to cure disease—how they act on living organisms during sickness.

Pharmacology is a similar but more modern term.

McGuigan—"A Textbook of Pharmacology and Therapeutics," 1928.

Pharmacology is the term used to include all knowledge of drugs and their actions. For convenience of study, pharmacology may be divided into the following branches:

1. *Pharmacodynamics* is the study of action of drugs on living organisms.

2. *Materia Medica* treats of the source, constituents, physical and chemical characteristics, preparations and doses of drugs.

3. *Pharmacognosy* may be considered as a part of *materia medica*, and deals especially with the recognition of drugs and the study of crude materials. The term *pharmacognosy* is sometimes used synonymously with *materia medica*.

4. *Pharmacy* is the science and art of preparing and dispensing drugs for medicinal use.

5. *Therapeutics* is the art and practice of treating abnormal states.

6. *Posology* is the science of dosage.

7. *Toxicology* deals with the symptoms, diagnosis, treatment and detection of poisons.

Sollmann—"A Manual of Pharmacology," 3rd ed, 1927.

Pharmacognosy deals with the origin and the anatomic and chemic structure of crude drugs.

Materia Medica is an older *obsolescent* title, which was used to include also the actions, uses and dosage.

Organic materia medica is limited to the drugs derived directly from the vegetable and animal kingdoms.

"Webster's New International Dictionary," 1929.

Materia Medica:

1. Materials or substances used in the composition of remedies; a general term for all substances used as curative agents in medicine.

2. That branch of medical science which treats of the nature and properties of all the substances employed for the cure of disease; one of the two branches of pharmacology.

Pharmacology—the science of drugs including *materia medica* and therapeutics.

Pharmacognosy—*Pharmacology*, or especially that branch of it treating of the characteristics of crude drugs and simples.

"Funk & Wagnall's New Standard Dictionary," 1926.

1. The branch of medical science that relates to medicinal substances, their nature, sources, mode of administration and effects upon the animal economy.

2. The substances employed as remedial agents.

"The Encyclopedia Americana" (1929), vol. 18, p. 425.

Materia Medica, that division or branch of medical science which treats of drugs, their origin, classification as natural products, preparation, purification, action on the animal economy, together with the mode of administering them for the relief and cure of disease.

Of the several definitions quoted that of Culbreth appears to be the most reasonable and logical in view of the history of the term *materia medica*. It appears also that Sollmann is correct in saying that, as applied to a science, it is an "obsolescent title." From the various definitions quoted it is also evident that the term "*Materia Medica*" is too broad to be applied to any one subject or even to more than one with any assurance of conveying a reasonably definite concept. The prefixing of such terms as "organic" or "inorganic" is of little if any value in limiting this as a title for a science. The term "*Materia Medica*" as a title for a science or as a title for a subject in a curriculum should be dropped and more suitable and definite terms used—terms which are limiting as to scope of subject matter and character of information.

As a generic term, with its literal meaning "materials of medicine," it probably has a place in our professional vocabulary. When used in this sense it would simply mean a list of all materials used in medicine and could be properly used as follows: "American *materia medica* is made up of several hundred items" or "Eupatorium has no place in modern *materia medica*."

In conclusion, it appears that as a title for a science the term "*materia medica*" should be dropped for the reason that materials of medicine may be studied from so many different angles that this term does not convey any meaning either as to scope or character of information.
