GLOSSARY OF INDIAN MEDICINAL PLANTS

BY

R. N. CHOPRA
Drug Research Laboratory, Jammu-Kashmir

S. L. NAYAR
Central Drug Research Institute, Lucknow

I. C. CHOPRA
Drug Research Laboratory, Jammu-Kashmir

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH
NEW DELHI
1956

951

PREFACE

THE important part played by the *Council of Scientific & Industrial Research* in promoting studies on Indian medicinal plants is well known. This is, in a great measure, due to the foresight of its late Director, Dr. Shanti Swarup Bhatnagar, F.R.S., whose deep concern and interest in all matters of scientific and economic importance to the country was unique. This book is respectfully dedicated by the authors to the memory of that great man who was largely instrumental in the establishment of the *Council* and, through it, organizing scientific research in our country on a sound basis.

The *Council of Scientific & Industrial Research* has been financing several schemes of research on indigenous drugs. It has established the Central Drug Research Institute in Lucknow, which is turning out work of high quality and great utility to the country. We are greatly indebted to the *Council* for publishing this volume which, it is hoped, will facilitate research on indigenous drugs generally and on Indian medicinal plants particularly. The authors are very grateful to Father H. Santapau of St. Xavier's College, Bombay, who very kindly went through the manuscript originally and checked up synonymy. They are also grateful to Messrs K. L. Handa, Research Chemist, and L. D. Kapoor, Botanist, for their help and advice in the preparation of this book.

R. N. CHOPRA
S. L. NAYAR
I. C. CHOPRA

Drug Research Laboratory
Jammu-Kashmir

Srinagar, 30th June 1956

INTRODUCTION

THE history of medicine in India can be traced to the remote past. The earliest mention of the medicinal use of plants is found in the *Rig Veda*, perhaps the oldest repository of human knowledge, having been written between 4500 and 1600 B.C. In the works which followed, particularly *Ayurveda*, the properties of various drugs have been given in detail. *Susruta Samhita* which was written not later than 1000 B.C. contains a comprehensive chapter on therapeutics and *Charaka Samhita*, written about the same period, gives a remarkable description of the materia medica as it was known to ancient Hindus. Later, during the Buddhist period, considerable progress was made and medicinal plants were cultivated under the direction of highly qualified specialists. Contacts with Greece and Rome, and later with Arabia and Persia, contributed to the enrichment of the Indian materia medica and a large number of vegetable and other products came into use for the treatment of diseases.

During the centuries that have gone by, the materia medica of the indigenous systems of medicine has become extensive and heterogeneous. Out of about 2,000 items recorded in Indian medical literature, less than 200 are of mineral and animal origin; the rest are derived from vegetable sources. The vegetable materia medica has been built up in the course of centuries and every region of India has contributed to its development. The practitioners of various Indian systems in different parts of India tried to utilize the locally growing plants as far as possible and accepted those which were found useful after trial for treatment of diseases.

Information on the use of medicinal plants is scattered and most of it is found in books and periodicals, many of which are out of print and are not available even in large libraries. Very little work of scientific value was done till the early part of this century and earlier publications on the subject not infrequently contain confused data derived from old literature copied without critical appraisal.

One of the greatest difficulties confronting the research worker is the paucity of authentic information on the identity, habitat, conditions of collection and use of medicinal plants. Medicinal properties, some genuine, some otherwise, have been attributed to a large variety of plants, more than 1,500 in number, in different parts of this vast country. Many vegetable drugs are used in preparations prescribed by practitioners of

indigenous medicine in different regions; others are used as household remedies by the common people.

The present authors often receive communications from workers in India and abroad for the supply of information on the medicinal properties and uses of flowers, roots, barks, leaves, etc., of plants used in indigenous medicine. In spite of the facilities at their disposal, the difficulty in obtaining authentic information from the scattered literature has been very real. The necessity for a work in which available information and correct data are concisely recorded so that it may serve as a guide to those interested in indigenous drugs has been keenly felt. With this object in view, a list of medicinal plants has been compiled and information based on a critical study of the literature has been collected.

SURVEY OF MEDICINAL AND POISONOUS PLANTS

With the financial assistance generously provided by the Indian Council of Agricultural Research and the Council of Scientific & Industrial Research, an all-India survey of medicinal and poisonous plants was started more than thirty years ago. The information relating to vernacular nomenclature, distribution of plants and local uses was verified by personal visits to centres of learning of indigenous medicine all over India. State forest officers and others were contacted to check information on the medicinal properties of plants and their uses as household remedies. All available literature was consulted and local herbaria and libraries were scrutinized. Along with this, references to recent work on plants were collected. The results of the survey have been briefly presented in the present volume. The survey is being continued.

Along with the survey authentic specimens of plants were collected for preservation. The specimens are important both for study and reference.

Identification of Indigenous Herbs — The drugs in use are many in number and varied in character. Many of them mentioned in old books baffle recognition and identification, as it is not possible to state with certainty from the description given in the literature whether the drug in actual use is the one described. Verbal descriptions given in old books are inadequate to the botanist for identifying plants or parts of plants. There has been a good deal of confusion in vernacular names. The same drug is sold under different names and different drugs are sold under the same name in different regions of India. In many cases, even learned practitioners of indigenous medicine are unable to say with certainty whether a particular drug is the same as the one prescribed in old texts.

Herbarium — The identification of drugs will remain the prime difficulty until the prominent characteristics of each drug are well established.

The only way in which this can be done is to have authentic specimens preserved in herbaria for purposes of comparison. This work was started along with the survey, but the progress was slow in the beginning as the botanical staff was too small to deal with such an extensive all-India problem expeditiously. The deficiency was made good to a certain extent in 1935 by a generous grant from the Indian Council of Agricultural Research and since then the work has progressed steadily. A substantial grant was provided later by the Council of Scientific & Industrial Research. The more common drug plants have been collected and preserved in the herbarium at Jammu. Several hundred more species have yet to be obtained to complete the collection of all plants with alleged medicinal or poisonous properties occurring in this subcontinent, but this will involve extensive tours and will take time. The herbarium now contains about 1,600 species (*c.* 16,000 mounted sheets). It is the first of its kind in India and is a valuable asset from the scientific and economic points of view.

The original collection has been divided into three sets. One is housed in the Forest Research Institute, Dehra Dun; the second in the Central Drug Research Institute, Lucknow; and the third set, the most complete of all, is housed in the Drug Research Laboratory, Jammu-Kashmir State. In addition, the parts of plants actually used in the treatment of diseases by indigenous practitioners are being collected and preserved. All the plants described in this Glossary will eventually have representative specimens in the herbarium. A catalogue of the herbarium is now in the course of preparation and will form a companion volume to the Glossary.

THE GLOSSARY

Much thought and attention has been given to the preparation of the Glossary. On the botanical side, an effort has been made to present, as far as possible, the nomenclature accepted as valid in current literature. It is hardly necessary to stress here the importance of quoting the authority when citing a plant name. Botanical synonymy is in a state of confusion and no plant name has full scientific value unless the name of the author is mentioned. It is unfortunate that a part of the chemical work on Indian medicinal plants is vitiated by lack of attention to the identification of the material investigated. Often results have been published as pertaining to a plant, while the plant actually investigated was entirely different from the one for which the results are reported.

Particular mention may be made of the inclusion in the present volume of a large number of plants which grow in India and which, though not used in indigenous medicine, are known to be used medicinally in other countries. Such plants are undoubtedly Indian and medicinal.

On the other hand, there are some imported drugs commonly sold in Indian bazaars and widely used medicinally. Such plants are no doubt medicinal but are not Indian by origin. These plants have been generally omitted and where included, a reference to their distribution will reveal that they are not Indian.

For the sake of brevity, the botanical description of plants has been omitted. There is no difficulty in obtaining the description from published literature. Kirtikar and Basu's book *Indian Medicinal Plants*, of which a revised edition has been published lately, is excellent for this purpose.

The plants have been arranged in alphabetical order according to their scientific names so that there will be no difficulty for readers to find any particular drug on which information is required. Many of the commonly used synonyms have been inserted and cross references to their modern scientific names have been given. Abbreviations have been used to save space and to compress data into a small handy volume; a list of abbreviations used has been included for ready reference. When a number of plants belonging to the same genus is discussed, the name of the family to which the plants belong is supplied with the scientific name of the genus. Important vernacular names commonly used in different regions of India have been given and an index of these names has been provided at the end. For want of space it has not been possible to include all vernacular names, but the more common and well-known ones are given. The conditions of disease for which the particular plant is used are also briefly given.

A special feature, which will not fail to attract attention, is the inclusion of brief descriptions of the active principles of plants so far as they have been worked out. References to the more important published papers on medicinal plants up to 1953 have been included; more recent references have been added in some cases during the course of printing of the book. For a complete bibliography on Indian medicinal plants the reader is referred to the *Review of Work on Indian Medicinal Plants* published by the Indian Council of Medical Research (1955).

Another feature of the Glossary is the inclusion of information on the distribution of plants in different regions of India. The description given in the literature has been revised as a result of our survey.

RESEARCH ON INDIGENOUS DRUGS

The question may be asked: " What is the value of research on Indian indigenous drugs ? " During recent years, chemists have synthesized potent remedies, such as arsenicals and antimalarial compounds, which have proved effective in the treatment of protozoal diseases, and sulphonamides useful in the treatment of bacterial diseases. Antibiotic drugs have revolutionized the treatment of bacterial and rickettsial

diseases and even some virus diseases are controlled by antibiotics. Diseases which were considered incurable a few years back are now cured by their use. In view of this, is there any necessity to continue research on indigenous drugs? Will it lead to useful results commensurate with the expense and time involved?

These questions have been answered in the editorial comments in the well-known British Journal, *The Practitioner* (Dec. 1950). It is stated: "The wise and experienced clinician never spurns an 'old wife's tale' until he has good evidence for doing so. The lore of the countryman is built upon the experience of generations, often of centuries, and the data upon which it is based have often been obtained at a price in human lives which no modern research worker would ever dream of considering. It is particularly appropriate at the present moment, when the pharmaceutical companies of the world are emitting an unceasing flow of new synthetic drugs, that attention should be turned to the possible remedies that may be found among indigenous herbs of this and other countries. Four examples of such research proving fruitful may be recalled. In eastern Mediterranean countries and in Arabia, the local physicians often prescribe a decoction of the dried seeds of a local plant, *Ammi visnaga*, as a diuretic and as an antispasmodic in renal colic. Investigations by G. V. Anidrep and his colleagues in Cairo (*Brit. Heart J.*, 1946, 171) showed the active constituent to be khellin, which they found to be an effective vasodilator with a selective action on the coronary arteries. Subsequent clinical trials demonstrated the value of khellin in the treatment of angina pectoris. From ancient times the root of an indigenous plant, *Rauwolfia serpentina*, has been widely used in India and Malaya as an antidote to insect and snake bites, as a febrifuge, as a stimulant to uterine contractions, and as a sedative. R. J. Vakil (*Brit. Heart J.*, 1949, 350) investigated its uses in hypertension and found it to have a marked hypotensive action."

"Even in the currently popular field of chemotherapy of tuberculosis, indigenous plants are proving of interest. Thus, Japanese workers have isolated from a vine named *Stephania cepharantha* and from a wisteria-like plant named *S. sasakii*, the alkaloid cepharanthine which is being used for the treatment and the prophylaxis of tuberculosis in Japan (*Jap. J. exp. Med.*, 1949, 69). Chinese workers have been investigating the anti-tuberculosis activity of a series of local plants and Virginia Wang (*Chin. med. J.*, 1950, 169) reports a prominent tuberculostatic activity in extracts of coptis root (*Coptis coinensia*), this activity apparently residing in its alkaloid, berberine sulphate. It is clear that much remains to be learned from a close study of indigenous herbs. It may well be that here lies one of the major contributions that countries such as China, India and Pakistan can make to the advancement of world health. Certainly this tendency should be encouraged by their colleagues in the West. We in the West have learned

much from the old cultures of the East. May it not be that the East can contribute much of value in yet another field, that of Therapeutics?"

Since the discovery of ephedrin from the Chinese drug 'Ma huang', Chinese materia medica has attracted the attention of many western research workers. Two schools of study exist in Peking and Shanghai which are engaged in the scientific appraisal of the claims of numerous Chinese indigenous drugs. A drug known as 'Chang-Shan' has, it is said, proved to be an antimalarial more or less of the same potency as quinine. During the Second World War, when China was almost completely cut off from the rest of the world, this drug is reported to have been used with considerable success in the treatment of malaria.

The fruits of *Ammi majus* Linn., closely related to *Ammi visnaga* Linn., have long been used by the Egyptians for the treatment of leucoderma. Research work has confirmed that this condition can be cured by the oral administration of an extract of this drug and subsequent exposure to sunlight of white patches on the skin. A crystalline active principle, ammordin, has also been isolated.

Rutin, now a well-known glycoside, originally derived from *Ruta graveolens* Linn., has been reported from 40 different species of plants, including buckwheat, tobacco, elder and forsythia. Until 1942, it was a laboratory curiosity; it is now being increasingly employed in the treatment of capillary fragility. Recently, an accidental discovery by a group of pharmacologists has led to what may be an important use of rutin in the treatment of the after-effects of exposure to atomic radiations.

Many more examples can be cited.

Synthetic processes for which a chemist employs heat and pressure are effected in plants at ordinary temperature and pressure. Chemists synthesized such alkaloids as quinine after intensive work extending over half a century, whereas the cinchona plant does this without difficulty every day. Many active antibiotics occur in plants and this is yet an unexplored and unexploited field. In fact, we are only at the threshold of plant research. What is in store, Nature alone knows. Research on plants should, therefore, go on in the interests of humanity. In Great Britain, Switzerland and the United States of America, intensive studies of Indian indigenous drugs have been taken up in various research centres.

Indian Indigenous Drugs — Systematic investigation of drugs used in indigenous medicine in India on modern scientific lines was started more than thirty years ago. A number of important medicinal plants prescribed by *kavirajas* and *hakims* have been investigated. The constituents have been examined, pharmacological action of the active principles worked out by animal experimentation, and preparations made

from the drugs have been tested on patients in hospitals. It is only by a thorough enquiry that the merits of these drugs can be proved and a demand created for them not only in India but also in other parts of the world.

A large number of drugs examined has been shown to possess significant activity, but they are not superior to those listed in the pharmacopoeias. They can, however, be used as substitutes for official drugs. Many drugs of questionable value and doubtful utility have crept into indigenous medicine and these have to be excluded after investigation.

Most of the drugs used in indigenous medicine are supposed to be specifics for some particular disease or other and lay people wax eloquent over cures said to have been effected by the use of some of them. Statements of this nature, supported by insufficient evidence, have sometimes appeared even in medical journals in India and abroad. This has done a great deal of harm to the reputation of indigenous drugs generally. There is a clear need for systematic research on Indian medicinal plants. This Glossary is addressed to those who are interested in such studies.

LIST OF BOOKS REFERRED TO

AINSLIE, W.— Materia Medica of Hindoostan, 1813.

AINSLIE, W.— Materia Indica, 1826.

ALLEN — Commercial Organic Analysis, 10 Vols., 1923-33.

BADEN POWELL — Punjab Products, 2 Vols., 1868.

BAILEY, L. H.— Manual of Cultivated Plants, 1944.

BAL, S. N.— Catalogue of Medicinal Plant Exhibits in the Indian Museum, 1932.

BENG. PLANTS — Bengal Plants, by D. Prain, 1903.

BENTHAL, A. P.— The Trees of Calcutta and its neighbourhood, 1946.

BENTLEY & TRIMEN — Medicinal Plants, 4 Vols., 1880.

BIRDWOOD, G.— Vegetable Products of Bombay Presidency, 1865.

BIRDWOOD, G. T.— Practical Bazar Medicines, 1920.

BOOHER, L. E., HOTZLER, E. R. & HEWSTON, E. M.— Vitamin Values of Food, 1942.

BOSE, K. C.— Official Drugs of India, 1902.

BOSE, K. C.— Pharmacopoeia Indica, 1932.

B.P.— The British Pharmacopoeia, 1948.

B.P.C.— The British Pharmaceutical Codex, 1949.

BROWN, W. H.—Minor Products of Philippine Forests, 3 Vols., 1920-21.

BURKILL — A Dictionary of Economic Products of the Malay Peninsula, 1935.

BUTTER, D.— Medical Topography of Oudh, 1839.

CHANDRASENA, J. P. C.— The Chemistry and Pharmacology of Ceylon and Indian Medicinal Plants, 1935.

CHINESE MAT. MED.— Chinese Materia Medica, by G. A. Stuart, 1911.

CHOPRA, R. N.— Indigenous Drugs of India, 1933.

CHOPRA, R. N. & CHANDLER, A. C.— Anthelmintics and their Uses in Medical and Veterinary Practice, 1928.

DENSTON, T. C.— A Text Book of Pharmacognosy, 1945.

DEY, K. L.— Indigenous Drugs of India, 1896.

DOLLARD, W.— Medical Topography of Kumaon and Shone Valley, 1840.

DRURY, H.— Useful Plants of India, 1873.

DUTT, N. B.— Commercial Drugs of India, 1928.

DUTTA, U. C.— Materia Medica of the Hindus, 1877.

DYMOCK, W.— Vegetable Materia Medica of Western India, 1883.

DYMOCK, WARDEN & HOOPER — Pharmacographis Indica, 3 Vols., 1890-99.

FINNEMORE, E.— The Essential Oils, 1926.

FLEMING, J.— Catalogue of Indian Medicinal Plants and Drugs, 1810.

FLUCKIGER & HANBURY — Pharmacographia, 1879.

FL. BR. IND.— Flora of British India, by J. D. Hooker, 7 Vols., 1872-97.

GILDEMEISTER, E. & HOFFMAN, F.— The Volatile Oils, 1900.

GNADINGER, C. B.— Pyrethrum Flowers, 1945.

GUENTHER — The Essential Oils, 6 Vols., 1948-52.

GUPTA, B. C.— Banausadhi Darpana, 1917.

HAINES, H. H.— The Botany of Bihar & Orissa, 1921-25.

HAAS & HILL — Chemistry of Plant Products, 1928-29.

HENRY, T. A.— The Plant Alkaloids, 1949.

HILL, A. F.— Economic Botany, 1937.

HOLMAN, H. J.— A Survey of Insecticide Materials of Vegetable Origin, 1940.

INDIGENOUS DRUGS INQUIRY — by R. N. Chopra (Central Indigenous Drugs Committee).

I.P.C.— Indian Pharmaceutical Codex, 1952.

I.P.L.— The Indian Pharmacopoeial List, 1946.

IRVINE, R. H.— General Medical Topography of Ajmere, 1841.

IRVINE, R. H.— Materia Medica of Patna, 1848.

KHORY & KHATRAK, N. N.—Materia Medica of India and their Therapeutics, 1903.

KIRTIKAR, K. R. & BASU, B. D.— Indian Medicinal Plants, 4 Vols., 1935.

KOMAN, M. C.— Report on the Investigation of Indigenous Drugs, 1920.

LINDLEY — Flora Medica, 1838.

MARTINDALE — The Extra Pharmacopoeia, 1941-43.
Mc. COSH, J.— Topography of Assam, 1837.
MOHAN, B. S.— Medicinal Drugs of India, 1930.
MOHIDEEN SHERIFF — Supplement to the Pharmacopoeia of India, 1869.
MOHIDEEN SHERIFF — Materia Medica of Madras, 1891.
MURRAY, J. A.— Plants and Drugs of Sind, 1881.

NADKARNI, K. M.— The Indian Materia Medica, 1927.
NAYAR & CHOPRA — Distribution of British Pharmacopoeial Drug Plants and their Substitutes Growing in India, 1951.

O'SHAUGHNESSY — Bengal Dispensatory, 1842.

PAMMEL — A Manual of Poisonous Plants, 1911.
PARKER, R. N.— A Forest Flora of the Punjab, 1918.
PARRY, E. J.— The Chemistry of Essential Oils and Artificial Perfumes, 2 Vols., 1921-22.
PUREWAL, S. S.— Vegetable Gardening in the Punjab, 1944.

RAMA RAO, M.— Flowering Plants of Travancore, 1914.
RAMASWAMI, M. N.— Minor Forest Products in Mysore — A Survey, 1945.
ROBERTS, E.— Vegetable Drugs of India and Ceylon, 1932.
ROSENTHALER, L.— The Chemical Investigation of Plants, 1930.
ROXBURGH, W.— Flora Indica, 1874.

SEN GUPTA — Ayurvedic System of Medicine, 1911.
SAKHARAM, ARJUN — Catalogue of the Bombay Drugs, 1879.
SHIVANATH RAI — Foodstuffs of India, 1940.
SMITH — Poisonous Plants of All Countries, 1923.
SOLLMAN, T.— A Manual of Pharmacology, 1936.
STEWART, J. L. — Punjab Plants, 1869.

TALBOT, W. A.— Forest Flora of Bombay Presidency and Sind, 2 Vols., 1909-11.
THORPE — Thorpe's Dictionary of Applied Chemistry, 10 Vols., 1945-50.
TREASE, G. E.— A Text Book of Pharmacognosy, 1945.

U.S.D.— The United States Dispensatory, 1947.

WALLIS, T. E.— Text Book of Pharmacognosy, 1946.
WARING — Bazar Medicines, 1874.
WARING — Pharmacopoeia of India, 1868.
WATT — A Dictionary of the Economic Products of India, 1889-96.
WATT, G.— Commercial Products of India, 1908.
WATT, J. M. & BREYER-BRANDWIJK, M. G.— The Medicinal and Poisonous Plants of Southern Africa, 1932.
WEALTH OF INDIA — Wealth of India, Vols. I, II and III, 1948-52.
WEHMER, C.— Die Pflanzenstoffe, 2 Vols., 1929-31, 1935.
WINTON, A. L. & WINTON, K. B.— The Structure and Composition of Foods, 4 Vols., 1935.
WREN, R. C.— Potter's Cyclopaedia of Botanical Drugs and Preparation, 1941.

LIST OF JOURNALS REFERRED TO

Acta med. philipp.— Acta medica philippina. Manila.
Acta pharm. Toxicol.— Acta pharmacologica et toxicologica. Kobenhavn.
Acta phytochim., Tokyo — Acta phytochimica. (Iwata Institute of Plant Biochemistry.) Tokyo.
Acta polon. pharm.— Acta Poloniae pharmaceutica. Warszawa.
Acta Univ. Asiae med.— Acta Universitatis Asiae Mediae. Tashkent.
Agric. Ledger — Agricultural Ledger. Calcutta.
Agric. Live-Stk India — Agriculture and Live-Stock in India. Delhi.
Amer. chem. J.— American Chemical Journal. Baltimore.
Amer. Drugg.— American Druggist. New York.
Amer. Heart J.— American Heart Journal. St. Louis.
Amer. J. Bot.— American Journal of Botany. Lancaster.
Amer. J. med. Sci.— American Journal of the Medical Sciences. Philadelphia.
Amer. J. Pharm.— American Journal of Pharmacy. Philadelphia.
Amer. Perfum.— American Perfumer and Essential Oil Review. New York.
An. Acad. Farm., Madr.— Anales. Real Academia de farmacia. Madrid.
Analyst — Analyst, London.
An. Asoc. quim. argent.— Anales de la Asociacion quimica argentina. Buenos Aires.
Ann. appl. Biol.— Annals of Applied Biology. Cambridge.
Ann. Biochem.— Annals of Biochemistry and Experimental Medicine. Calcutta.
Ann. Bot., Lond.— Annals of Botany. London.
Ann. chim.— Annales de chimie. Paris.
Ann. Chim. appl., Roma — Annali di chimica applicata. Roma.
Ann. Chim (Phys.) — Annales de chimie (et de physique). Paris.
Ann. Inst. Pasteur — Annales de l'Institut Pasteur. Paris.
Ann. Jard. bot. Buitenz.— Annales du Jardin botanique de Buitenzorg.
Ann. pharm. franc.— Annales pharmaceutiques francaises. Paris.
Annu. Progr. Rep., Cen. Drug. Res. Inst. Lucknow — Annual Progress Report of the Central Drug Research Institute. Lucknow.
Annu. Rep. bot. Gdn, Calcutta — Annual Report, Botanic Garden. Calcutta.
Annu. Rep. Puerto Rico Agric. exp. Sta.— Annual Report of the Puerto Rico Agriculture Experimental Station,
An. Soc. esp. Fis. Quim.— Anales de la real sociedad espanola de fisica of quimica (Madrid).
An. Univ. S. Domingo — Anales de la Universidad de Santo Domingo. Trujillo.
Apothekerztg. Berl.— Apothekerzeitung. Berlin.
Apoth. Ver.— Apotheker Verein.
Arb. Gesundh Amt., Berl.— Arbeiten aus dem Kais, Gesundheitsamte. Berlin.
Arch. Biol., Curitiba — Archivos de biologia e tecnologia. Curitiba.
Arch. Biol. S. Paulo — Archivos de biologra. Sao Paulo.
Arch. Chem. Farm., Warsz.— Archivum chemji i farmacji. Warszawa.
Arch. exp. Path. Pharmak.— Archiv fur experimentelle Pathologie u. Pharmakologie. Leipzig.
Arch. Farmacol. sper.— Archivio de farmacologia sperimentale e scienze affini. Roma.
Arch. Hyg., Berl.— Archiv fur Hygiene (und Bakteriologie). Munchen u. Berlin.
Arch. Pharm. Berl.— Archiv der Pharmazie. Berlin.
Arch. Sci. biol. Napoli — Archivio di scienze biologiche. Napoli.
Arch. Soc. Biol., Montevideo — Archivos de la Sociedad de biologia de Montevideo.
Arch. urug. Med.— Archivos uruguagos de medicina, Cirugia y especialidades. Montevideo.
Aust. J. Pharm.— Australasian Journal of Pharmacy. Melbourne.
Aust. vet. J.— Australian Veterinary Journal. Sydney.

Ber. dtsch. bot. Ges.— Bericht der Deutschen Botanischen Gesellschaft. Berlin.
Ber. dtsch. chem. Ges.— Bericht der Deutschen Chemischen Gesellschaft. Berlin.
Ber. dtsch. pharm. Ges.— Bericht der Deutschen Pharmazeutischen Gasellschaft. Berlin.
Ber. ges. Physiol.— Bericht uber die gesamte Physiologie und experimentelle Pharmakologie. Berlin.
Ber. Schimmel u. Co., Lpz.— Bericht von Schimmel u. Co., Leipzig, uber aetherische Oele, Ricchstoffe, usw. Leipzig.

Biederm. Zbl.— Biedermanns Zentralblatt fur Agrikulturchemie und rationellen Landwirtschaftsbetrieb. Leipzig.
Biochem. J.— Biochemical Journal. Cambridge.
Biochem. Z.— Biochemische Zeitschrift. Berlin.
Biochim. Terap. sper.— Biochimica e terapia sperimentale. Milano.
Biol. Zbl.— Biologisches Zentralblatt. Leipzig.
Bol. Acad. farm. Rio de J.— Boletim da academia nacional de farmacia. Rio de Janeiro.
Bol. Ass. bras. pharm.— Boletim da Associacao brasileira de pharmaceuticos. Rio de Janeiro.
Boll. chim.-farm.— Bollettino chimico-farmaceutico. Milano.
Boll. Soc. eustach.— Bollettino della societa Eustachiana. Camerino.
Boll. Soc. ital. Biol. sper.— Bollettino della Societa italiana di biologia sperimentale. Napoli.
Bol. Minist. Agric., Rio de J.— Boletim do Ministerio da agricultura (industria e commercio). Rio de Janeiro.
Bot. Arch.— Botanisches Archiv. Berlin.
Bot. Gaz.— Botanical Gazette. Chicago.
Bot. Zbl.— Botanisches Zentralblatt. Jena & Dresden.
Brazil-med.— Brazil-medico. Rio de Janeiro.
Brit. chem. Abstr.— British Chemical Abstracts.
Brit. Heart J.— British Heart Journal. London.
Brit. med. J.— British Medical Journal. London.
Brit. vet. J.— British Veterinary Journal. London.
Bull. Acad. Med. Belg.— Bulletin de l'Academie de medecine de Belgique. Bruxelles.
Bull. Acad. Roum.— Bulletin de la — Section Scientifique de l'Academie Roumaine.
Bull. Acad. Sci. Unit. Prov.— Bulletin of the Academy of Sciences of the United Provinces of Agra and Oudh. Allahabad.
Bull. agric. chem. Soc. Japan — Bulletin of the Agricultural Chemical Society of Japan. Tokyo.
Bull. chem. Soc. Japan — Bulletin of the Chemical Society of Japan. Tokyo.
Bull. Coun. Sci. industr. Res. Aust.— Bulletin. Council for Scientific and Industrial Research. Melbourne.
Bull. Dep. Agric. Ind. neerl.— Bulletin du dep. de l'agriculture aux Indes Neerlandaises. Buitenzorg.
Bull. imp. Inst., Lond.— Bulletin of the Imperial Institute. London.
Bull. Indian industr. Res.— Bulletin of Indian Industrial Research. Delhi.
Bull. Inst. bot. Buitenz.— Bulletin de l'Institut botanique de Buitenzorg. Buitenzorg.
Bull. Inst. Pin.— Bulletin de l'Institut du pin. Bordeaux.
Bull. int. Acad. cracovie (Acad. pol. Sci.) — Bulletin international de l'Academie des sciences et des lettres de Cracovie (de l'Academie polonaise des sciences). Cracovie.
Bull. Jard. bot. Buitenz.— Bulletin du Jardin botanique de Buitenzorg. Buitenzorg.
Bull. Ky agric. Exp. Sta.— Bulletin of the Kentucky Agricultural Experiment Station. Lexington.
Bull. nat. Formul. Comm.— Bulletin of the National Formulary Committee of the American Pharmaceutical Association. Washington.
Bull. Sci. pharm.— Bulletin des sciences pharmacologiques. Paris.
Bull. Soc. Chim. biol., Paris — Bulletin de la Societe de chimie biologique. Paris.
Bull. Soc. chim., Fr.— Bulletin. Societe chimique de France. Paris.
Bull. Soc. Chim., Paris — Bulletin de la Societe chimique de Paris.
Bull. Tokyo Inst. Tech.— Bulletin of the Tokyo Institute of Technology. Tokyo.
Bull. Univ. Asie cent.— Bulletin de l'Universite de l'Asie centrale. Tachkent.
Cal. med. J.— Calcutta Medical Journal. Calcutta.
Canad. J. Res.— Canadian Journal of Research. Ottawa.
Cardiologia — Cardiologia. Basel.
Cas. csl. Lek.— Casopis Ceskoslovenskeho Lekarnictva. Praha.
Cas. Lek. ces.— Casopis Lekaru Ceskych. v Praze.
Chem. Abstr.— Chemical Abstracts. Easton, Pa.
Chem. Ber.— Chemische Berichte. Heidelberg und Berlin.
Chem. & Drugg.— Chemist and Druggist. London.
Chemikerztg — Chemikerzeitung. Gothen (Anhalt).
Chem. & Ind.— Chemistry and Industry. London.
Chem. Listy — Chemicke Listy pro Vedu a Prumysl. Praha.
Chem. News — Chemical News and Journal of Physical (Industrial) Sciences. London.
Chem. Weekbl.— Chemisch Weekbald. Amsterdam.
Chem. Zbl.— Chemisches Zentralblatt. Berlin.
Chim. industr. appl., Milano — Chimica industriale e applicata. Milano.
Chin. J. Physiol.— Chinese Journal of Physiology. Peking.

Chin. med. J.— Chinese Medical Journal. Shanghai.
Circ. La agric. Exp. Sta.— Circular. Louisiana Agricultural Experiment Station. Baton Rouge.
Contr. Boyce Thompson Inst.— Contributions. Boyce Thompson Institute for Plant Research. Menasha, Wis.
C.R. Acad. Sci., Paris — Compte rendu hebdomadaire des seances de l'Academie des sciences. Paris.
C.R. Acad. Sci. U.R.S.S.— Compte rendu de l'Academie des Sciences de l'*U.R.S.S.*
C.R. Soc. Biol., Paris — Compte rendu hebdomadaire des seances, et memoires de la Societe de biologie. Paris.
Curr. Sci.— Current Science. Bangalore.

Dansk Tidsskr. Farm.— Dansk Tidsskrift for Farmaci. Kjobenhavn.
Dokl. obsch. Sobr. Ak. Nauk S.S.S.R.— Dokladi na obschem Sobranii (Akd. Hauk U.S.S.R.).
Drug Cosmet. Ind.— Drug and Cosmetic Industry. New York.
Drugg. Circ.— Druggist's Circular. New York.
Dtsch. ApothZtg — Deutsche Apothekerzeitung. Berlin.
Dtsch. Heilpfl.— Deutsche Heilpflanze. Stollberg i.E.
Dtsch. ParfumZtg — Deutsche Parfumeriezeitung. Berlin.

E. Afr. agric. J.— East African Agricultural Journal. Nairobi.
Econ. Bot.— Economic Botany. Lancaster, Pa.
Experientia — Experientia. Basel.
Exp. Med. Surg.— Experimental Medicine and Surgery. New York.

Farmacoter. act.— Farmacoterapia actual. Madrid.
Farmakol. i-Toksikol.— Farmakologiya i Toksikolgiya. Moscow.
Farmatsiya — Farmatsiya. Moscow.
Farmatsiya i Farmakol.— Farmatsiya i Farmakologiya.
Farm. Zh.— Farmatsevtichnie Zhurnal. Kharkiv.
Fitoterapia — Fitoterapia. Rivista trimestrale di studi e applicazioni di piante medicinali.
Fmr's Bull. U.S. Dep. Agric.— Farmers' Bulletin. U.S. Department of Agriculture. Washington.
Folia med. Napoli— Folia medica. Napoli.
Folia Pharm. jap.— Folia pharmacologica japonica. Kyoto.
Food — Food, prescrving, packing, marketing. London.
For. Bull. Dehra Dun — Forest Bulletin. Forest Research Institute, Dehra Dun.
For. Res. India — Forest Research in India (and Burma). Delhi.

Gambrinus — Gambrinus. Brauer-u. Hopfenzeitung. Wien.
Gazz. chim. ital.— Gazetta chimica italiana. Roma.

Helv. chim. acta — Helvetica chimica acta. Basel, Genf.
Hlth Bull.— Health Bulletin, Delhi.
Hoppe-Seyl. Z.— Hoppe-Seyler's Zeitschrift fur physiologische Chemie. Strassburg.

Indian Fmg — Indian Farming. Delhi.
Indian Food Packer — Indian Food Packer. Delhi.
Indian For.— Indian Forester. Dehra Dun.
Indian For. Bull.— Indian Forest Bulletin. Dehra Dun.
Indian For. Leafl.— Indian Forest Leaflet. Dehra Dun.
Indian For. Rec.— Indian Forest Records. Dehra Dun.
Indian J. agric. Sci.— Indian Journal of Agricultural Science. Delhi.
Indian J. Ent.— Indian Journal of Entomology. New Delhi.
Indian J. med. Res.— Indian Journal of Medical Research. Calcutta.
Indian J. Pharm.— Indian Journal of Pharmacy. Benares.
Indian J. vet. Sci.— Indian Journal of Veterinary Science and Animal Husbandry. Delhi.
Indian med. Gaz.— Indian Medical Gazette. Calcutta.
Indian med. Rec.— Indian Medical Record. Calcutta.
Indian Soap J.— Indian Soap Journal. Calcutta.
Indian Tr. J.— Indian Trade Journal. Calcutta.
Industr. Engng Chem.— Industrial and Engineering Chemistry. Easton, Pa. Industrial Edition.
Industr. Engng Chem. (News) — Industrial and Engineering Chemistry. Easton, Pa., News Edition.
Ingen. Ned. Ind.— Ingenieur in Nederlandsch-Indie.

J. agric. chem. Soc. Japan — Journal of the Agricultural Chemical Society of Japan. Tokyo.
J. agric. Res.— Journal of Agricultural Research. Washington.
J. Amer. chem. Soc.— Journal of the American Chemical Society. Easton, Pa.
J. Amer. pharm. Ass.— Journal of the American Pharmaceutical Association. Columbus.
J. Amer. Soc. Agron.— Journal of the American Society of Agronomy. Washington.
J. Amer. vet. med. Ass.— Journal of the American Veterinary Medical Association. Ithaca, N.Y.

J. Annamalai Univ.— Journal of the Annamalai University. Annamalainagar.

Jap. J. med. Sci.— Japanese Journal of Medical Sciences, Abstracts. Tokyo.

J. Asiat. Soc. Beng.— Journal and Proceedings of the Asiatic Society of Bengal. Calcutta.

J. Ass. off. agric. Chem. Wash.— Journal of the Association of Official Agricultural Chemists. Washington.

J. Biochem. Tokyo — Journal of Biochemistry. Tokyo.

J. biol. Chem.— Journal of Biological Chemistry. Baltimore.

J. Bombay nat. Hist. Soc.— Journal of the Bombay Natural History Society. Bombay.

Jb. wiss. Bot.— Jahrbuch fur wissenschaftliche Botanik. Berlin.

J. chem. Engng China — Journal of Chemical Engineering, China. Tientsin.

J. chem. Soc.— Journal of the Chemical Society. London.

J. Chin. chem. Soc.— Journal of the Chinese Chemical Society. Peiping.

J. Coll. Agric. Tokyo — Journal of the College of Agriculture, Imp. University of Tokyo.

J. comp. Path.— Journal of Comparative Pathology and Therapeutics. Edinburgh, London.

J. Elisha Mitchell sci. Soc.— Journal of the Elisha Mitchell Scientific Society. Chapel Hill, N.C.

J. exp. Med.— Journal of Experimental Medicine. New York.

J. For.— Journal of Forestry. Washington.

J. gen. Chem., Moscow — Journal of General Chemistry. Moscow.

J. Indian chem. Soc.— Journal of the Indian Chemical Society. Calcutta.

J. Indian chem. Soc. industr. Edn — Journal of the Indian Chemical Society. Industrial and News Edition. Calcutta.

J. Indian Inst. Sci.— Journal of the Indian Institute of Science. Bangalore.

J. Indian med. Ass.— Journal of the Indian Medical Association. Calcutta.

J. industr. Engng Chem.— Journal of Industrial and Engineering Chemistry. Easton, Pa.

J. Instn Chem. India — Journal and Proceedings of the Institution of Chemists (India). Calcutta.

J. int. Soc. Leath. Chem.— Journal of the International Society of Leather Trades Chemists. London.

J. Linn. Soc. (Bot.) — Journal of the Linnean Society (Botany). London.

J. Malaria Inst. India — Journal of the Malaria Institute of India. Calcutta.

J. Mysore For. Assoc.— Journal of the Mysore Forest Association. Mysore.

J. Mysore Univ.— Journal of the Mysore University. Mysore.

J. Nutr.— Journal of Nutrition. Baltimore.

J. Okayama med. Soc.— Journal of the Okayama Medical Society. Okayama.

J. Pharmacol.— Journal of Pharmacology and Experimental Therapeutics. Baltimore.

J. Pharm. Anvers.— Journal de pharmacie. Anvers.

J. pharm. Belg.— Journal de pharmacie de Belgique. Bruxelles.

J. Pharm. Chim., Paris — Journal de pharmacie et de chimie. Paris.

J. Pharm., Lond.— Journal of Pharmacy and Pharmacology. London.

J. pharm. Soc. Japan — Journal of the Pharmaceutical Society of Japan. Tokyo.

J. Physiol.— Journal of Physiology. London and Cambridge.

J. prakt. Chem.— Journal fur praktische Chemie. Leipzig.

J. roy. Soc. N.S.W.— Journal and Proceedings of the Royal Society of New South Wales. Sydney.

J. sci. industr. Res.— Journal of Scientific and Industrial Research. Delhi.

J. Soc. chem. Ind. Lond.— Journal of the Society of Chemical Industry. London.

J. Soc. phys.-chim. russe — Journal of the Russian Physical and Chemical Society.

Jt Publ. Commonw. agric. Bur.— Joint Publications. Imperial (Commonwealth) Agricultural Bureaux. Aberystwyth.

J. Univ. Bombay — Journal of the University of Bombay (a) Biological Sciences; (b) Physical Sciences.

J. Wash. Acad. Sci.— Journal of the Washington Academy of Sciences. Washington.

Kew Bull.— Kew Bulletin. Royal Botanic Gardens. Kew.

Khim. ref. Zh.— Khimicheskii Referativnii Zhurnal. Moscow.

Klin. Wschr.— Klinische Wocheuschrift. Berlin.

Koninkl. Ned. Akad. Wetenschap., Proc.— Koninklijke Nederlandse Akademie van Wetenschappen, Proceedings.

Lancet — Lancet. London.

Liebigs Ann.— Liebigs Annalen der Chemie. Leipzig.

Lijecn. Vijesn.— Lijecnicki Vijesnik. u Zagrebu.

Madras agric. J.— Madras Agricultural Journal. Madras.

Malay. agric. J.— Malayan Agricultural Journal. Kuala Lumpur.

Meded. PlTuin, Batavia — Mededeelingen uit'sLands Plantentuin. Batavia.

Med. Klinik — Medizinische Klinik. Wien.

Med. Mschr.— Medizinische Monatsschrift. Zeitschrift fur allgemeine Medizin und Therapie.
Med. Welt.— Medizinische Welt. Berlin.
Merck's Jber.— Merck's Jahresbericht uber Neuerungen auf d. Geb. d. Pharmakotherapie u. Pharmazie. Darmstadt.
Mfg Chem.— Manufacturing Chemist. London.
Mh. Chem.— Monatschefte fur Chemie und verwandte Teile anderer Wissenschaften. Wien.
Milchw. Forsch.— Milchwirtschaftliche Forschungen. Berlin.
Misc. Bull. imp. Coun. agric. Res. India — Miscellaneous Bulletins. Imperial (Indian) Council of Agricultural Research, India. Delhi.
Mitt. naturf. Ges. Bern — Mitteilungen der Naturforschenden Gesellschaft in Bern.

Natural appl. Sci. Bull.— Natural and Applied Science Bulletin. University of the Philippines. Manila.
Nature, Lond.— Nature. London.
Ned. Tijdschr. Pharm. Chem. Toxic.— Nederlandsch tijdschrift voor pharmacie chemie en toxicologie. S' Gravenhage.

Oil Fat Industr.— Oil and Fat Industries. New York.
Oil & Soap — Oil and Soap. Chicago.
Onderstepoort J. vet. Sci.— Onderstepoort Journal of Veterinary Science and Animal Industry. Onderstepoort, Pretoria.
Ost. Apothker. Ver.— Österreichische Apotheker-Zeitung.
Ost. bot. Z.— Österreichische botanische Zeitschrift. Wien.

Pacif. Sci.— Pacific Science. Honolulu.
Parfum. mod.— Parfumerie moderne. Paris.
Parfums de Fr.— Parfums de France. Paris.
Patna Univ. J.— Patna University Journal. Patna.
Perfum. essent. Oil Rec.— Perfumery and Essential Oil Record. London.
Pflanzer — Pflanzer. Zeitschrift fur Land -u. Forstwirtschaft in Deutsch-Ostafrika. Dar-es-Salam.
Pharm. Acta Helvet.— Pharmaceutica Acta Helvetiae. Zurich.
Pharmazie — Pharmazie. Berlin.
Pharm. Ind., Berl.— Pharmazeutische Industrie. Berlin.
Pharm. J.— Pharmaceutical Journal and Pharmacist. London.
Pharm. J. Trans.— Pharmaceutical Journal and Transactions. London.
Pharm. Mh.— Pharmazeutische Monatshefte. Wien.
Pharm. Post — Pharmazeutische Post. Wien.
Pharm. Pr.— Pharmazeutische Presse. Wien.
Pharm. Rev.— Pharmacological Reviews. Baltimore.
Pharm. & Toxic.— Pharmacology and Toxicology. Moscow.
Pharm. Weekbl.— Pharmaceutisch weekblad voor Nederland. Amsterdam.
Pharm. Zentralh.— Pharmazeutische Zentralhalle f. Deutschland. Dresden.
Pharm. Z. Russland — Pharmazetische Zitschrift fur Russland.
Pharm. Ztg, Berl.— Pharmazeutische Zeitung. Berlin.
Philipp. Agric.— Philippine Agriculturist. Los Banos.
Philipp. J. Sci.— Philippine Journal of Science. Manila.
Prakt. Akad. Athen.— Praktika tes Akademias Athenon.
Pr. med.— Presse medicale. Paris.
Proc. Acad. Sci., Unit. Prov.— Proceedings of the Academy of Sciences of the United Provinces of Agra and Oudh. Allahabad.
Proc. Amer. Soc. hort. Sci.— Proceedings. American Society for Horticultural Science. College Park, Md.
Proc. chem. Soc. Lond.— Proceedings of the Chemical Society. London.
Proc. imp. Acad. Japan — Proceedings of the Imperial Academy (of Japan). Tokyo.
Proc. Indian Acad. Sci.—Proceedings of the Indian Academy of Science. Bangalore.
Proc. Indian Sci. Congr.— Proceedings of the Indian Science Congress. Calcutta.
Proc. Lenin Acad. agric. Sci.— Proceedings of the Lenin Academy of Agricultural Sciences of the U.S.S.R.
Proc. nat. Acad. Sci. India — Proceedings of the National Academy of Sciences, India. Allahabad.
Proc. nat. Inst. Sci. India — Proceedings of the National Institute of Sciences of India. Calcutta. Delhi.
Proc. R. Irish Acad.— Proceedings of the Royal Irish Academy. Dublin.
Proc. roy. Soc.— Proceedings of the Royal Society. London.
Proc. Soc. biol. Chem. India — Proceedings of the Society of Biological Chemists, India. Bangalore.
Proc. Soc. exp. Biol., N.Y.— Proceedings of the Society for Experimental Biology and Medicine. New York.
Puerto Rico J. publ. Hlth — Puerto Rico Journal of Public Health. San Juan.

Quart. J. Indian Inst. Sci.— Quarterly Journal of the Indian Institute of Science. Bangalore.
Quart. J. Pharm.— Quarterly Journal (and yearbook) of Pharmacy and Allied Sciences (and Pharmacology). London.

Rass. econ. colonie Italy — Rassegna economica delle colonie (Italy).

Rec. Trav. chim. Pays-Bas — Recueil des travaux chimiques des Pays-Bas et de la Belgique. Leyde.

Rep. Bd sci. Adv. India — Report of the Board of Scientific Advice for India. Calcutta.

Rep. Cacao Res. Trinidad — Report. Cacao Research. Imperial College of Tropical Agriculture. Port of Spain.

Repert. Pharm.— Repertorium der Pharmazie.

Rep. gen. Chim. appl.— Répertoire général de chimie pure et applicquée. Paris.

Rep. Hung. agric. Exp. Sta.— Report of the Hungarian Agricultural Experiment Stations. Budapest.

Rep. Indian Mus.— Report of the Indian Museum, Natural History Section. Calcutta.

Rep. Mysore agric. Dep.— Report of the Department of Agriculture, Mysore. Bangalore.

Rep. Pharm.— Répertoire de pharmacie et Archives de pharmacie. Paris.

Rep. P.R. agric. Exp. Sta.— Report Porto Rico (Federal) Agricultural Experiment Station, Mayaguez. Washington.

Rep. Sch. trop. Med. Calcutta — Report. School of Tropical Medicine. Calcutta.

Rep. vet. Res. S. Afr.— Report on (of Director of) Veterinary Research (Series). Department of Agriculture, Union of South Africa. Pretoria.

Rev. Asoc. méd. argent.— Revista de la Asociación médica argentina. Buenos Aires.

Rev. clin. esp.— Revista clinica esparola. Madrid.

Rev. esp. Fisiol.— Revista espanola de fisiologia. Barcelona.

Rev. Fac. Cienc. quim. La Plata — Revista de la Facultad de ciencias quimicas (de quimica y farmacia). La Plata.

Rev. filip. Med.— Revista filipina de medicina y farmacia. Manila.

Rev. Flora med.— Revista da flora medicinal. Rio de Janeiro.

Rev. Inst. bact., B. Aires — Revista del Instituto bacteriologico, Buenos Aires.

Rev. méd. lat.-amer.— Revista médica latino-americana. Buenos Aires.

Rev. quim.-farm., Santiago — Revista quimico-farmaceutica. Santiago de Chile.

Rev. Quim. industr., Rio de J.— Revista de quimica industrial. Rio de Janeiro.

Rev. sudamer. Endocr.— Revista sudamericana de endocrinologia, immunologia y quimioterapia. Buenos Aires.

Riv. ital. Essenze — Rivista italiana delle essenze e profumi. Milano.

Roczn. Chem.— Rocznik Chemji. Warszawa.

S. Afr. J. med. Sci.— South African Journal of Medical Sciences. Johannesburg.

S. Afr. J. Sci.— South African Journal of Science. Cape Town.

Schimmel Rep.— Reports on Essential Oils, Synthetic Perfumes, etc. Schimmel & Co., Melitz, Leipzig.

Schweiz. ApothZtg — Schweizerische Apothekerzeitung. Zürich.

Schweiz. med. Wschr.— Schweizerische medizinische Wochenschrift. Basel.

Sci. & Cult.— Science and Culture. Calcutta.

Science — Science. New York.

Sci. Pap. Inst. phys. chem. Res. Tokyo — Scientific Papers of the Institute of Physical and Chemical Research. Tokyo.

Sci. pharm.— Scientia pharmaceutica. Wien.

Sci. Rec., Chungking — Science Record. Chungking.

Sci. Technol. China — Science and Technology in China. Nanking.

Seifensiederztg — Seifensiederzeitung. Augsburg.

Semana mèd. B. Aires—Semana mèdica. Buenos Aires.

Soap sanit. Chem.— Soap (and Sanitary Chemicals). New York.

Sovetsk. vrach. Zh.— Sovietskii Vrachebnyi Zhurnal. Moscow, Leningrad.

Soviet. Med., Moscow — Sovietskaya Meditsina. Moscow.

Soviet Plant Ind. Rec.— Soviet Plant Industry Record. Moscow, Leningrad.

Trans. Bose Res. Inst.— Transactions of the Bose Research Institute. Calcutta.

Trans. chem. Soc. — Transactions of the Chemical Society. London.

Trans. roy. Soc. trop. Med. Hyg. — Transactions of the Royal Society of Tropical Medicine and Hygiene. London.

Trav. Lab. Biogeochim. U.R.S.S.— Trudy Biogeokhimicheskoi Laboratorii. Akademia Nauk U.S.S.R. Leningrad.

Trib. farm.— Tribuna farmaceutica. Curitiba.

Trop. Agriculturist — Tropical Agriculturist and Magazine of the Ceylon Agricultural Society. Peradeniya.

Trop. Dis. Bull.— Tropical Diseases Bulletin. London.

Trud. nauch. khim.-farm. Inst. Mosk. — Trudy Nauchnovo Khimiko-Farmatsevtircheskovo Instituta. Moscow.

Univ. Allahabad Studies — Allahabad University Studies. Allahabad.

Vet. J.— Veterinary Journal. London.

West. J. Surg.— Western Journal of Surgery, Obstetrics and Gynecology. Portland, Ore.

Wiad. farm — Wiadomości Farmaceutyczne. Warszawa.
Wien. med. Wschr.— Wiener medizinische Wochenschrift. Wien.

Yearb. Pharm.— Yearbook of Pharmacy. London.

Z. allg. öst. ApothVer.— Zeitschrift des Allgemeinen Österreichischen Apothekervereins. Wien.

Zbl. Physiol.— Zentralblatt für Physiologie. Leipzig.
Z. ges. exp. Med.— Zeitschrift für die gesamte experimentelle Medizin. Berlin.
Zh. prikl. Khim. Mosk.— Journal Prikladnoi Khimi. Moscow.
Z. Untersuch. Lebensmitt.— Zeitschrift für Untersuchung der Lebensmittel. Berlin.
Z. Vitaminforsch.— Zeitschrift für Vitaminforschung. Bern.

ABBREVIATIONS

Abortif.	abortifacient
Absorb.	absorbent
Alk.	alkaloid
Alter.	alterative
Amenor.	amenorrhoea
Amorph.	amorphous
Antibil.	antibilious
Anthelm.	anthelmintic
Antid.	antidote
Antidysen.	antidysenteric
Antilith.	antilithic
Antimal.	antimalarial
Antiper.	antiperiodic
Antiphlegm.	antiphlegmatic
Antiphl.	antiphlogistic
Antipyr.	antipyretic
Antiscor.	antiscorbutic
Antisep.	antiseptic
Antisp.	antispasmodic
Antisyp.	antisyphillitic
Aper.	aperient
Aphrodis.	aphrodisiac
Arab.	Arabic
Arom.	aromatic
Astrin.	astringent
B.	Bengal
Bo.	Bombay State
Broncht.	bronchitis
Burm.	Burma
Carmin.	carminative
Catar.	catarrhal
Cath.	cathartic
Cholag.	cholagogue
Chr.	chronic
Constip.	constipation
Dec.	Deccan
Decoct.	decoction
Demulc.	demulcent
Deod.	deodorant
Diaphor.	diaphoretic
Diar.	diarrhoea
Digest.	digestive
Diur.	diuretic
Dysen.	dysentery
Dysmen.	dysmenorrhoea
Dyspep.	dyspepsia
Emmen.	emmenagogue
Emol.	emollient
Essen. oil.	essential oil
Expect.	expectorant
Febge.	febrifuge
Galact.	galactagogue
Glucd.	glucoside
Gonor.	gonorrhoea
H.	Hindi
Haemat.	haematuria
Haemor.	haemorrhage
Ind. Baz.	Indian Bazaars
Indign.	indigestion
Inflam.	inflammation
Irrit.	irritant
Kan.	Kanarese
Kash.	Kashmir
Lactag.	lactagogue
Laxt.	laxative
Leucor.	leucorrhoea
M.	Madras State
Mal.	Malayalam
Mat. Med.	materia medica
Menor.	menorrhagia
Mucil.	mucilage
Nep.	Nepal
Nutri.	nutritious
P.	Punjab
Pers.	Persian
Phlegm.	phlegmatic
Purg.	purgative
Refrig.	refrigerant
Resolv.	resolvent
Restor.	restorative
Rheum.	rheumatic
Rubft.	rubefacient
S.	Sanskrit
Santh.	Santhal
Sialog.	sialogogue
Sing.	Singhalese
Stim.	stimulant
Stomch.	stomachic
Subst.	substitute
Syn.	synonym
Tam.	Tamil
Tel.	Telugu
Tox.	toxic
Var.	variety
Vern.	vernacular
Vet.	veterinary
Vesic.	vesicant