own hands many of these evils would soon eliminate themselves from the drug-stores. Right here it may be said that there is nothing unprofessional or derogatory in the dispensing of his own medicines by the physician. In England it has been the universal practice for centuries in all places except the largest cities, and it has been given up by a part of the medical profession only as a matter of convenience to themselves, not as a right belonging to the pharmacist. The homeopaths fought for the reclamation of this practice as a right belonging to the medical profession, and succeeded in securing its legality, but not from a worthy motive. They dispense their own medicines in order to cover up the fraudulent practices of which they are often guilty, and to give them the power of administering full doses of powerful drugs in a form which is apparently "homeopathic," with no tell-tale prescription on file in a drug-store to give mute but dangerous evidence against their honesty. In this way they administer several grains of calomel or eighth-grain doses of morphine, or correspondingly large quantities of active alkaloids, triturated with sugar of milk, or dissolved as many of the latter may be in alcohol. Chemistry, by isolating the active principles of plants, and furnishing them to commerce in the form of soluble salts, has enabled the homeopath to practice this fraudulent method of dispensing drugs, which the innocent and ignorant patient, who believes in the power of the minimum dose, supposes to be infinitesimal in amount. But the physician of the regular profession is too apt to think that if he uses a practice which charlatans have appropriated to themselves, he may be classed with them by his professional competitors. Hence, many regular physicians are absolutely afraid to use such drugs as Aconite, Belladonna, Gelsemium, and Arnica, all of which are official, and older in medicine than homeopathy; and avoid pocket-cases, drachm-vials and triturations, as badges of charlatanism. It is high time that we asserted our independence in all these matters, and made use freely of those means which are recommended by our individual judgments as promotive of the best results to our patients and to ourselves. With a small stock of reliable fluidextracts, and an equally moderate supply of gelatin-coated pills and compressed tablet-triturates from the best houses, physicians could checkmate the unscrupulous practices of many druggists to a great extent, save their patients many dollars, and retain many a dollar for their own pockets which under the present system goes to their enemies. The homeopaths understand the money part of the argument well. When their patients' medicine is exhausted, the doctor must be seen for a fresh supply, meaning of course another consultation about symptoms, a change perhaps from *Mercurius Dulcis* to *Mercurius Vivus*, and another fee. The expense is nothing, sugar of milk being cheap, and there is no prescription in the patient's pocket-book, to be renewed scores of times (paying toll however every time to the druggist), and finally to be copied by aunts, mothers, and friends, as a "sovereign remedy" for a cough, or a "really wonderful receipt" for a case of croup.

Prescription Blanks.

After many years' experience in prescribing on blanks furnished by druggists, the writer has come to the conclusion that it is much better, for many reasons, for the physician to have his own blanks, without the address of any drug-store thereon. These blanks should be furnished with stubs on which to write the prescription at first in rough, afterwards copying it out cleanly on the main blank. A careful prescriber always writes a formula twice before letting it go out of his hands. It he does the first writing on the stub of a book of blanks he will always have a copy of the prescription in his possession, for which he may afterwards be thankful. The blank used by the writer measures $4\frac{1}{4}$ inches by $3\frac{1}{4}$, joined by a perforated edge to a stub $3\frac{1}{4}$ inches by $2\frac{1}{2}$ inches. On the main blank the physician's name and address are printed, together with his office-hours, and a place for number and date, also the sign ℞., and a line for signature. On the stub are printed the words, "*Copy of Prescription No.....For.....*"

These blanks are bound up in books of 100 each, with a flexible morocco cover, from which the book of stubs may be slipped and a fresh book inserted as required. The size is ample for all ordinary requirements, and permits of the book being carried in the breast-pocket.

INCOMPATIBILITY.

Incompatibility may be Chemical, Pharmaceutical or Therapeutical, according as the prescribed combination results in chemical decomposition physical disassociation or antagonistic action. In the first case the incompatibility may be unintentional or intentional on the part of the prescriber, for in many cases the result of the chemical action affords the substance desired.

Instances of intentional incompatibility are the mixtures of Calomel or Corrosive Sublimate with Limewater, producing the Black and Yellow Oxides of Mercury respectively and commonly known as *Black Wash* and *Yellow Wash*. Such a combination should not be filtered (as a novice might suppose), but should be dispensed with a Shake-label, in order that the precipitate may be uniformly distributed before using.

Chemical Incompatibility generally results from neglect on the part of the prescriber of the most common chemical reactions, such as that—

Acids tend to combine with bases and to form salts.

Weak acids or bases are displaced from their combinations by stronger ones,

so that salts in solution when brought together generally exchange their radicles, especially if by doing so an insoluble compound can be formed.

A salt in solution is easily decomposed by a strong alkali if the salt is one having a weak or volatile base.

A substance in solution may be decomposed by another without precipitation, the product being soluble in the solution.

Alkaloidal salts are precipitated from their solutions by the addition of fixed alkalies, their salts, or salts which produce insoluble compounds. Oxides of the fixed alkalies decompose salts of the metals proper and those of the alkaloids, precipitating their bases; but the base may be soluble in excess of the alkali.

Tannic and Gallic Acids and vegetable substances containing them precipitate albumin, alkaloids and most of the metallic oxides, and form inky solutions when brought into contact with the persalts of Iron. Tannic Acid precipitates gelatin.

Glucosides are incompatible with free Acids and with Emulsin.

Examples of the neglect of these principles are seen in the prescribing of Quinine Sulphate in mixture with Potassium Acetate, resulting in a voluminous precipitate of Quinine Acetate which cannot be poured from the bottle;—Vinegars or Syrups containing Acetic Acid (Syr. Allii, Syr. Scillæ) added to a solution of alkaline carbonates, causing decomposition of the latter with evolution of CO_2;—the addition of Liquor Potassii Hydroxidi to a solution of Ammonia-alum, setting free gaseous ammonia; the mixing of Strychnine Sulphate and Potassium Bromide in solution, causing the decomposition of the alkaloid sulphate and precipitation of strychnine;—preparations of Cinchona with salts of Iron, forming an inky tannate of iron;—Elixir of Chloral with Alkalies, causing the elimination of chloroform and its subsequent evaporation.

Insoluble Salts.—The following more or less insoluble salts will be formed whenever the materials of which they are composed are brought together in solutions:—the Hydroxides, Carbonates, Phosphates, Borates, Arsenates and Tannates of most earthy and heavy metals and alkaloids, and the metallic Sulphides; the Sulphates of Calcium and of Lead, and the subsalts of Mercury; the Chlorides, Iodides, and Bromides of Bismuth, Silver, and Lead; the Iodides of Quinine, of Morphine, and of most alkaloids.

Instances are—Limewater or Aromatic Spirit of Ammonia with Tincture of Chloride of Iron or solutions of Mercury salts, or neutral solutions of Quinine or Morphine salts.

Ammonium, Potassium, and Sodium Carbonates or Bicarbonates with Limewater.

Solutions of Magnesium Sulphate, Alum, Zinc Acetate or Sulphate, with solutions of salts of Iron, Manganese, Bismuth, Antimony, Lead, and most alkaloids.

Ammonium or Sodium Phosphates with solutions of Iron Salts, with Limewater, solution of Magnesium Sulphate, of Alum, etc.

Liquor Potassii Arsenitis with Limewater, with solutions of basic salts of Iron, and with solutions of neutral salts of Quinine and Morphine, etc.

Solutions, Decoctions, Tinctures, and Extracts containing Tannic Acid with solutions of salts of Iron, Mercury, Antimony, Lead, also with solutions containing albuminous substances and Gelatin.

Limewater with solutions of Quinine Sulphate or Morphine Sulphate.

Solutions of Lead Acetate with Zinc Sulphate or Alum.

Sodium Chloride with Silver Nitrate.

Morphine Hydrochloride with Lead Acetate.

Alkaline Iodides or Bromides with Bismuth Carbonate or Subnitrate, with Lead Acetate, with Subchloride of Mercury, or with neutral solutions of Quinine, Morphine and Strychnine salts.

Table of Precipitant Solutions.

The following table shows the most important instances of solutions which mutually precipitate each other, the letter P meaning "forms a precipitate with"—

Solutions of—	Alkaloidal Solutions (generally).	Metallic Solutions (generally).	Solutions of Lead Salts.	Solutions of Silver Salts.	Solutions of Calcium Salts.	Solutions of Magnesium Salts.	Solutions of Albumin.	Solutions of Gelatin.
Alkalies,	P	P	P	P	P	P	.....	.....
Tannic Acid,	P	P	P	P	.....	.....	P	P
Carbonic Acid and Carbonates,	P	P	P	P	P	P	.....	.....
Sulphuric Acid and Sulphates,	.....	.....	P	P	P	P	.....	.....
Phosphoric Acid and Phosphates,	P	P	P	P	P	P	.....	.....
Boric Acid and Borates,	P	P	P	P	.....	.....	.....	.....
Hydrochloric Acid and Chlorides,	.....	.....	P	P	.....	.....	.....	.....
Hydrobromic Acids and Bromides,	.....	.....	P	P	.....	.....	.....	.....
Hydriodic Acid and Iodides,	P	.....	P	P	.....	.....	.....	.....
Sulphides,	.....	P	P	P	.....	.....	.....	.....
Arsenical Preparations,	.....	P	P	P	.....	.....	.....	.....
Albumin,	.....	P	P	.....	.....	.....	.....	.....

Explosive Compounds result from the admixture of powerful oxidizing agents with substances which are readily oxidizable. The most important members of these two classes are as follows:—

Oxidizers.	*Oxidizable, (Combustible).*
Chlorine and its Oxides.	Phosphorus. Hypophosphites.
Free Hydrochloric Acid.	Sulphur. Sulphides.
Nitro-hydrochloric Acid.	Glycerin. Sugar. Alcohols.
Chlorates. Hypochlorites.	Oils. Ethers. Tannin.
Chromates. Chromic Trioxide.	Cork. Charcoal. Creosote.
Permanganates.	Dry Organic Substances.
Nitric Acid. Nitrates.	Powdered Iron and Zinc.
Bromine. Bromates.	Arsenic Trioxide.
Iodine. Iodates.	Cyanides.
Silver Oxide.	Oxalates.
Peroxides (Dioxides).	Ferrous, Mercurous and Stannous salts.

Explosions have resulted from mixing Fluidextract of Uva Ursi with certain samples of *Spirit of Nitre*, Chromic Trioxide with *Glycerin*, Potassium Permanganate with *Glycerin*, Nitric Acid with *Glycerin*, Silver Nitrate with *Creosote*, Silver Oxide in pill with *Extract of Gentian*, Potassium Chlorate with *Glycerin* and Tincture of *Ferric Chloride*. Calcium Chloride triturated with *Sulphur* in a mortar has exploded, so also has Calcium or Sodium Hypophosphite when triturated alone. Tincture of Iodine with *Ammonia* forms the Iodide of Nitrogen, which is highly explosive, especially if triturated in the presence of water. Catechu and *Potassium Chlorate* in a dentifrice have exploded in the mouth from the friction produced by a dry tooth-brush. Lozenges of *Potassium Chlorate*, carried in the pocket with a box of safety matches, have exploded by rubbing against the composition on the outside of the box, causing an extensive burn of the thigh.

Hydrogen Dioxide is peculiar in that it acts both as an oxidizer and as an oxidizable agent. It reduces oxidizing agents and is itself reduced at the same time, hence it is incompatible with all the substances mentioned above. *Nitrites* may act in the same way under favorable circumstances.

Poisonous Compounds may be formed by the admixture of many substances in solution, such as—

Potassium Chlorate with *Potassium Iodide*, in solution together do not react at ordinary temperatures, but in the system they evolve a poisonous agent, probably Potassium Iodate.

Potassium Chlorate with *Syrup of Ferrous Iodide*, liberates Iodine from the iodide in the warm stomach, causing severe gastric irritation, perhaps gastritis of dangerous degree.

Dilute Hydrocyanic Acid or Potassium Cyanide with *Calomel*, forms the Bichloride and Bicyanide of Mercury, both virulent poisons;—with *metallic hydroxides*, carbonates, sub-nitrates or sub-chlorides, *cyanides* of the metals are formed which are even more poisonous than the acid itself in its usual diluted form.

Pharmaceutical Incompatibility differs from chemical incompatibility in the absence of chemical action, and is generally produced by adding one substance to another which, through differences in solubility, cause a precipitation of solid matter or a separation of part of the liquid. The separated constituents may be active and hence important, or inert and therefore unimportant.

Instances of this are—the addition of an acid to a Quinine and Licorice mixture, resulting in precipitation of the Glycyrrhizin (relied on to cover the taste of the Quinine) by the acid; or the use of Quinine, Tincture of Ferric Chloride and Licorice together; or the prescribing of solutions of Chloral and Potassium Bromide with an alcoholic preparation, the Chloral separating to the top as an alcoholate, and therefore dangerously in excess for the first few doses; or the neglect to prescribe Acacia or some other emulsifier in mixtures of an alcoholic fluidextract of a resinous body with an aqueous preparation, which would result in the separation of the resin to the surface and an overdose with the first teaspoonful.

When a fluidextract is diluted with a liquid differing in composition from those used in the fluidextracts, the gum, albumin, resin and mucilage are often separated. In such a case as Fluidextract of Cannabis Indica the active resin would be thrown out of its alcoholic solution and floating on top might cause serious symptoms; but in many other instances the precipitate would be inert and filtration would be in order. Water is the solvent for albuminous, gelatinous, gummy and saccharine bodies and for a large number of inorganic salts; while Alcohol is the solvent for volatile oils and resins, gum-resins, resinoids, balsams and all drugs containing these as their active principles. The solvent power of either Alcohol or Water for their particular substances decreases in proportion to the amount of the other added.

Instances of Pharmaceutical Incompatibility.

Resinous Tinctures or Fluidextracts with aqueous solutions.
Tincture of Guaiac with Spirit of Nitrous Ether.
Compound Infusion of Gentian with Infusion of Wild Cherry.
Compound Infusion of Cinchona with Compound Infusion of Gentian.
Essential Oils with aqueous liquids in quantities exceeding 1 drop to ℥j.
Fixed Oils and Copaiba with aqueous liquids (except excipients).
Tinctures made with Alcohol with those made with Diluted Alcohol.
Alcoholic Tinctures and Fluidextracts with aqueous preparations.
Spirit of Nitrous Ether with strong mucilages.
Infusions generally with metallic salts.

Therapeutical Incompatibility arises when two agents are administered together which oppose each other in their action on the human system,—as

for instance Belladonna in any form with Physostigma. But in many cases physiological antagonists are designedly prescribed together, one as a guard against the action of the other, as the hypodermic administration of Morphine and Atropine. The antagonists to each of the active medicinal agents may be found in Part III, under the title POISONING. They are summarized in the table of antagonistic poisons on page 19.

Dangers of Incompatibility may in great measure be avoided by the use of the utmost simplicity in prescribing. The subject can only be glanced at within these pages, but the following simple rules may help the burdened memory of the student and practitioner.

Never use more than one remedy at a time, if one will serve the purpose for which you are prescribing.

Never use *Strong Mineral Acids* with other agents, unless you know exactly what reaction will ensue. They decompose salts of the weaker acids, and form ethers when combined with alcohol. Never combine *Free Acids* with hydroxides or carbonates.

Select the simplest solvent, diluent or excipient you know of, remembering that the solvent power of alcohol and of water for their respective substances decreases in proportion to the quantity of the other added.

Generally do not combine two or more soluble salts; for such salts in solution, when brought together, usually exchange their radicles thereby forming an insoluble compound, (see page 518).

Never prescribe a drug with any of its Tests or Antidotes.

Never prescribe a *Glucoside*, as Santonin, Colocynthin, in combination with *Free Acids* or with a substance containing *Emulsin*, as these agents will decompose it.

Aconite should be ordered in water alone, *Corrosive Mercuric Chloride* by itself in water or in simple syrup. The latter drug is incompatible with almost everything, even the compound syrup of sarsaparilla being said to decompose it.

Potassium Iodide decomposes most of the metallic salts, and is one of the drugs which are best administered alone.

The following-named substances are incompatible with so many others that they should always be prescribed alone; they are best given in simple solution:—

Alum.
Dilute Hydrocyanic Acid.
Dilute Nitro-hydrochloric Acid.
Sulphuric Acid.
Mercuric Chloride (Corr. Sub.).
Iodine and Iodides.
Syrup of Ferrous Iodide.
Potassium Permanganate.
Potassium Acetate.
Potassium Bromide.
Tartar Emetic.
Tincture of Guaiac.
Morphine Acetate.
Morphine Hydrochloride.
Quinine Sulphate.
Liquor Calcis.
Liquor Potassii Hydroxidi.
Liquor Potassii Arsenitis.
Liquor Ferri Nitratis.
Tinct. Ferri Chloridi.
Zinc Acetate.
Iron and Quinine Citrate.
Free Chlorine in solution.
Tannic and Gallic Acids.

Silver Nitrate and *Lead Acetate* and *Subacetate*, though incompatible with almost everything, may be combined with *Opium*, the latter forming therewith a compound which though insoluble is therapeutically active as an astringent and anodyne lotion. *Silver Nitrate* with *Creosote* forms an explosive compound.

Tannic and Gallic Acids, and substances containing them (as the astringent bitters), precipitate albumin, alkaloids and most soluble metallic salts. They may be prescribed with the proto-salts of Iron, but not with its per-salts. *Calumba* is the best vegetable tonic to use with ferric salts, as it contains neither tannic nor gallic acid. *Tannic Acid* precipitates gelatin.

Iodine and the soluble *Iodides* are incompatible with the alkaloids and substances containing them, also with most metallic salts.

Alkalies neutralize free acids, and precipitate the alkaloids and the soluble non-alkaline metallic salts. *Oxides of the Alkalies* decompose salts of the metals proper and salts of the alkaloids, precipitating their bases; but the base may be soluble in an excess of the alkali.

Resinous Tinctures or *Fluidextracts*, (*e. g.*, Tinct. Cannabis Indicæ), when combined with aqueous solutions should always have Acacia or some other emulsifying agent added, to prevent the separation of the resin, which otherwise will be deposited on the sides of the bottle or will float on top of the mixture.

Tincture of Digitalis should not be mixed with aqueous or syrupy solutions for in such cases precipitation or decomposition of the active principles may occur. This tincture is injured by admixture and is best administered on sugar or dropped on a piece of bread.

EXTEMPORANEOUS PHARMACY.

This is the most important division of Pharmacy, embracing as it does the preparation and dispensing of those medicines which are designed for immediate use and are compounded on the prescriptions of physicians. Hence it comprises the chief portion of the daily work of the pharmacist, and can be learned only at the dispensing counter under the personal supervision of a competent master. In the following pages are given the most important of the general directions pertaining to this subject, with the object, so far as the limits of the book will admit, of enabling the young medical practitioner to familiarize himself with the compounding and dispensing of drugs. The drug-store of the present day has degenerated so much from its legitimate business that ere long physicians will be compelled in self defense to dispense their own medicines, thereby protecting themselves and their patients from the patent-medicine vending, the counter-prescribing, and the many other nefarious methods which

have degraded the pharmacist from his old professional position to that of a mere trader in drugs and nostrums. The first outfit of every young doctor should include a few pharmaceutical instruments and a small stock of drugs. By the daily handling of these, the tools of his profession, he will insensibly become familiar with the technique of the art, and even if he does not continue to dispense his medicines in after years he will never regret possessing the practical knowledge which such a course will give him.

Compounding means the mixing or preparing of the drugs ordered in a prescription, and comprises all the operations of official pharmacy together with many other manipulations which will be described in their appropriate places.

Dispensing is the operation of putting up and issuing the drugs ordered in a prescription, and may apply to the already compounded preparations of official pharmacy as well as to those prepared extemporaneously

Filling a Prescription means a combination of operations which requires great care, undivided attention, and a special practical apprenticeship at the dispensing desk. In the following discussion of extemporaneous preparations such hints are incorporated as are particularly applicable to the compounding of each article under consideration; and they may be prefaced by a few general suggestions which will serve to point out the most approved method of dealing with this important part of the druggist's work.

The prescription should first be slowly read over in a critical spirit, but no word or action of unfavorable criticism should reach the ears or eyes of the messenger. To shrug the shoulders when scanning the items, to laugh or even smile at the phraseology, to question the person offering it as to whom it is for, or for what complaint it is given, are instances of such flagrant treason to the prescriber as would justify the most complete professional ostracism of the offender. The compounder has no business whatever with the propriety of the prescription for its purpose. It might have been given as a *placebo* for reasons eminently wise and judicious; or if not so constituted it has at least been ordered by one who is in possession of facts about which the druggist knows nothing, even if by education and experience the latter were competent to judge in the matter, which he seldom is. His criticism should be directed only to the dosage and the pharmaceutical compatibility of the ingredients. Even in the latter case he must remember that incompatibles are often prescribed with the view of forming another agent by the chemical reaction produced. If he thinks that there is any mistake, or that the quantities ordered are in any degree poisonous, it is his duty to make an excuse for delay to the messenger and at once communicate with the physician. This course, in these days of telephones, is nearly always practicable.

After reading the prescription, it is well to first number it and then write the label. This gives time for the label to dry, and avoids the use of blotting