

Salol breaks up into salicylic and carbolic acids, and in full doses is apt to produce hemoglobinuria. The same objection holds good against all the carbolic derivatives, except the sulphocarbolates. I have given these salts to many persons and never saw nor heard of a case of hemoglobinuria. The iodic antiseptics occasionally cause iodism, even in small doses. Eczematous individuals especially appear to possess the power of setting free iodine from iodoform, eucrophen, etc. The biniodide of mercury has been strenuously advocated by Illingsworth, and the action of copper arsenite upon the duodenum demonstrated by Aulde, while mercury bichloride has also its advocates. But the highly toxic character of these and similar antiseptics confines their use within narrow limits. The volatile oils, various chlorin preparations, sulphurous acid, hydrogen dioxide and potassium permanganate, are among the other antiseptics that have been urged for internal use; but the objections to all, for indiscriminate prescription, are obvious. It is, however, notable that good effects have been obtained from many agents of this class. The principle is of wider applicability than that of any agent in the group.

The sulphocarbolates labor under the disadvantages of being common and cheap—they cost about 60 cents a pound, as against a dollar an ounce for the proprietary articles; they can be prepared by any manufacturing chemist, and have no commercial interests to push them; and finally, they have no name great in the councils of medicine to back them up. Deprived of the potent support of printers' ink, they rest solely upon their merit, without puffing, and on this basis have won a place in the armamentaria of thousands of physicians to whom utility is the only incentive to the employment of medicine.

I have only spoken of the sulphocarbolate of zinc, but there are two other salts of this group that deserve notice. Sodium sulphocarbolate may be given in doses of 20 to 30 grains. The bodies of animals to which it has been given resist putrefaction for a long time. It has been recommended as a remedy for vomiting, for fermentative affections, and for pseudo-membranous diseases, with gangrene or necrosis, such as scarlatina and diphtheria. Several reports appeared some years ago as to its value in these affections. J. W. White pronounced it antacid, astringent, sedative, styptic, antiseptic and disinfectant. The sulphocarbolate of lime is also quite free from local irritant effects, and somewhat more antiseptic than the soda salt. Of the three, I prefer the zinc when a strong and certain effect is required, as in cholera infantum, typhoid fever, or marked intestinal sepsis; the soda sulphocarbolate, when the stomach is irritable, for milder forms of sepsis, or when an antacid is also indicated; the calcium sulphocarbolate for strumous or tubercular cases, or any other in which the reconstructive effects of lime are required, or where other lime-salts are indicated. These three sulphocarbolates have been combined in tablets, and for indeterminate cases these have fulfilled every requirement, being effective and non-irritant.

**Transplantation of Stenson's Duct.**—In a case of recurring fistula, Goris opened up the duct from its starting-point to its termination in the mouth, which he detached from all adhesions, excising all the surrounding connective tissue. He then fastened it with a couple of stitches behind its natural location; endermic suture of the cutaneous incision. Recovery was prompt and by first intention.—*Presse Méd.*, September 3.

## INCOMPATIBLES.

Presented to the Section on Materia Medica, Pharmacy and Therapeutics, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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To the practitioner, as well as to the patient and pharmacist, the prescription is an object of importance. Upon it the welfare of each one of these more or less depends. If it fails the mission of the physician and of the pharmacist fails. Heretofore, schools and colleges of medicine have not laid sufficient stress upon the combining of medicines. Within the last few years there has been a change for the better, and the graduates at the present time know more than did the graduates of a few years ago. However, even yet it is the exception rather than the rule to meet a young man who knows more than a little about writing prescriptions, and he may consider himself fortunate if he knows more than a little about the individual ingredients of the prescription. It is not his fault, but that of his professors, that he is not better prepared for this part of his work. The student, while in college, should be so thoroughly drilled in combining the best preparations in the best way that it will come naturally to him to write a correct prescription from the start.

The mere writing of a list of substances is not all that is necessary for a good prescription. In the first place, the physician must have diagnosed the case properly, and when he has determined what drugs will probably meet with the best success, he must choose what individual preparations will go together with the best result. It is in choosing the preparations that he so frequently fails. Let me illustrate with a single example. Suppose it is desirable to give tincture of chloride of iron, strychnin sulphate, some preparation of arsenic and some preparation of cinchona, with the syrup of orange as a vehicle. Naturally the physician would choose Fowler's solution and a tincture of cinchona. In filling such a prescription there is danger of the alkali in the Fowler's solution precipitating the strychnin, the alkaloids in the cinchona and also the iron, and the ferric hydrate thus precipitated would combine with the arsenic to form an insoluble compound. And again, the tannin in the cinchona would combine with the iron, forming the black, inky, ferric tannate. In place of Fowler's solution the solution of arsenous acid should be used, it having the same physiologic effect and being of the same strength, but acid in reaction. In place of the tincture of cinchona there should be used quinin sulphate, or some such preparation as the National Formulary compound elixir of quinin, or the detannated tincture of cinchona.

In writing a prescription the physician must bring into use his knowledge of materia medica, therapeutic, physics, chemistry and pharmacy. No single one of these divisions will give him the requisite information; he must know therapeutics, in order to avoid physiologic incompatibility; he must know pharmacy and the physical properties of drugs in order to avoid pharmacologic incompatibility; and he must know chemistry to avoid chemie incompatibility.

Perhaps the two great stumbling blocks to the physician in this line are pharmacy and chemistry. Without a knowledge of both he is at sea. His only

safeguard is to prescribe one or at most two substances together. This is no doubt desirable sometimes, although not always. I have had medical students ask me what good it will do them to spend so much time on these subjects. My answer has been to study assiduously now and they will know the use hereafter. That actual harm has sometimes come to patients from taking incompatible prescriptions is a fact beyond dispute, and we have the watchful pharmacist to thank that there are not more such cases. And even though no ill effect may result from an incompatible mixture, frequently no good comes from it, and we blame our books, the drugs, and the pharmacists for not getting the results that we expected, when our ignorance of pharmacy and chemistry is the cause. No doubt we have all had our nerves somewhat rudely shaken by being told that a pet combination of ours is rendered either dangerous or inert by chemic reaction.

A few general rules can be given in regard to what will form incompatible mixtures, but the majority of cases must be learned as isolated facts. These general rules are given in nearly every book on materia medica as fully as I could give them in such a paper as this. Many times we see the bare statement that two substances are incompatible, and to know this and nothing more is unsatisfactory and frequently useless. Because chemic reaction takes place, it does not necessarily follow that the mixture should not be prescribed, or that the products formed will not have a similar physiologic action. We should know what changes occur and what compounds are produced, otherwise how can we tell what the effects will be? Will the action of a mixture of spirit of nitrous ether and potassium iodid be the same as either or both taken separately? Or is the effect of an application of a mixture of lead water and laudanum similar to the effect of these preparations when applied separately? Are the effects of the green iso-nitroso-antipyrin what are wanted when antipyrin is prescribed with spirit of nitrous ether? Then let us not denounce the pharmacist as having worthless preparations, or accuse the physiologist of having made mistakes in regard to the actions of medicines, until we know that the failure is not due to incompatibility.

The number of incompatibilities is one which will increase rather than decrease with time. With the advent of nearly every new remedy the number is increased. Particularly is this true of the new synthetic compounds with which the country has been flooded for the past few years. Physiologic incompatibility does not occur in a prescription nearly as frequently as chemic or pharmaceutic. This is not because the physician has given this part of the subject more consideration, but due partly, at least, to the fact that he is not generally tempted to put into the same prescription remedies that are antagonistic.

To become convinced that the subject of incompatibility is one which has not received the attention which its importance demands, we have but to glance over the appended prescriptions, which are a few of those to be found in standard works on medicine and therapeutics. When our best authorities fall into such errors, it is not to be wondered at that the beginner should make many mistakes. Those of us who come in contact with students in medical colleges should give more instruction along this line. It is one of the weak points in the curriculum of many

colleges. A neglect of this subject by a physician means a continual menace to the life of his patient.

R Collodii,  
Spt. ammoniæ,  
Tinct. iodi, aa part aeq.  
Sig.—Paint over part with a camel's-hair brush.  
—Potter's Mat. Med. and Ther., 6th ed., p. 716.

In this prescription the iodine is changed chiefly to ammonium iodid with a little ammonium iodate. Did the prescriber know this and did he wish to get the action of these instead of the action of iodine?

R Hydrarg. iodic viridis. . . . . gr.  $\frac{3}{4}$  | 0485  
Potass. chlorat. . . . . gr. iij | 1943  
Potass. iodic. . . . . gr.  $\frac{3}{4}$  | 0485  
Chocolate, q. s.  
M.—Ft. in tabellum No. 1.  
—Hare's System of Prac. and Ther., Vol. ii, p. 160.

In the presence of moisture the potassium iodid reacts with the mercurous iodid, causing the formation of metallic mercury and the much more active mercuric iodid (the red iodid of mercury). The potassium chlorate in the presence of a mineral acid, as the hydrochloric acid of the gastric juice, causes the iodine to be set free.

R Hydrarg. chlor. corrosiv. . . . . gr. ss | 0324  
Potassii iodidi. . . . .  $\frac{3}{4}$  ss | 15555  
Decocti cinchonæ. . . . . fl $\frac{3}{4}$  viij | 238195  
S.—Fl $\frac{3}{4}$  ter die post cibum.  
—Farquharson's Ther. and Mat. Med., p. 334.

The potassium iodid combines with the corrosive sublimate and forms first the red iodid of mercury, and then combines with this to form the soluble double compound—potassium mercuric iodid. This double compound combines with the alkaloids of cinchona in the decoction and forms a precipitate. The danger in this prescription lies in the mercury being thrown out of solution. Did the physician realize that it is possible for the patient thus to take most of the mercury at one dose?

R Sodii sulphitis. . . . .  $\frac{3}{4}$  ij | 7775  
Sp. ætheris. nit. . . . .  $\frac{3}{4}$  ss | 15555  
Liq. ammon. acet. . . . .  $\frac{3}{4}$  iij | 93309  
Aq. dist. . . . .  $\frac{3}{4}$  ij | 62206  
Mix.—Sig. Teaspoonful every two hours.  
—Hare, Vol. ii, p. 391.

The spirit of nitrous ether is decomposed, giving off the gas, nitric oxid, and part of the sodium sulphite is changed to sodium sulphate.

R Hydrargyri. . . . . gr.  $\frac{1}{8}$  | 008  
Iodini. . . . . gr.  $\frac{1}{2}$  | 0323  
Ac. tannici. . . . . gr.  $\frac{3}{4}$  | 0388  
Glycerini. . . . . m. xv | 0615  
M.—Hare, Vol. ii, p. 125.

The iodine will change the mercury to mercuric iodid. The tannic acid will change part of the iodine, with the formation of hydriodic acid, which will further combine with the red iodid of mercury.

R Tinct. ferri chloridi. . . . .  $\frac{3}{4}$  ij | 7775  
Acidi sulphurosi. . . . .  $\frac{3}{4}$  j | 3887  
Potas. chlorat. . . . .  $\frac{3}{4}$  j | 3887  
Glycerinæ. . . . .  $\frac{3}{4}$  ss | 15555  
Aq. calcis., q. s. ad. . . . .  $\frac{3}{4}$  iij | 93309  
Misce. Dose: one teaspoonful every hour to two hours for a child of three years.  
—Smith's Diseases of Children, 6th ed., p. 321.

On adding the sulphurous acid to the tincture of iron the mixture becomes of a much darker color at first and then nearly colorless. The glycerin may now be added and then the potassium chlorate dissolved in the water. There is barely a sufficient amount of water to dissolve the chlorate, and after

mixing with the ingredients some of the salt is thrown out of solution by the alcohol in the tincture. The possible reactions are as follows: 1, Between the ferric chlorid and sulphurous acid, forming ferric sulphite and hydrochloric acid; 2, the ferric sulphite thus formed changes to ferrous sulphate; 3, between the potassium chlorate and the hydrochloric acid in the tincture, forming chlorin; 4, between this chlorin and the ferrous sulphate, forming ferric sulphate and hydrochloric acid; 5, between the chlorin and the sulphurous acid, forming sulphuric and hydrochloric acids; 6, between the chlorin and the glycerin; 7, between the potassium chlorate and the sulphurous acid, forming potassium sulphate and hydrochloric acid; 8, between the ferric chlorid and the lime water, forming ferric hydrate and calcium chlorid; 9, between the sulphurous acid and the lime water, forming calcium sulphite.

Did the prescriber determine beforehand what products would be formed and that these were the compounds whose actions were wanted?

### GLANDULAR EXTRACT.

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Glandular physiology in its widespread ramifications has revolutionized many parts of physiology and pathology. It is only in its infancy and its maze of metabolic changes holds many facts to be discovered. The secretion of the ductless glands opens up new avenues of investigation, which will enrich the science of physiology and the practical application of these facts in therapeutics. We have a silent and hitherto unsuspected secretion going on which plays a most important and unknown part in our economy. Very potent remedies are the ductless glands, where but a few thousandths of a grain of a gland like the pituitary greatly elevates the arterial tension. I have made over one hundred experiments upon the lower animals with the various extracts obtained from Armour & Co. of Chicago. The experiments upon the reflexes were made upon frogs, those on pulse pressure, respiration and temperature upon rabbits. The results were as follows:

*Adrenals.*—The adrenals caused an increase of reflex activity, which was as fugitive as the rise in arterial tension. It also depressed the pulse rate. The rise of blood-pressure was due to an action upon the walls of the artery. It decreased the rate of respiration.

*Pituitary.*—It depressed reflex activity for a short period; reduced the heart-beat and elevated arterial tension. This elevation was due to an action upon the arterial wall. The respiration rate was increased by it.

*Spleen.*—The spleen diminished reflex action. It also depressed the pulse and temporarily the arterial tension. Afterward the arterial tension increased. It had an unusual action in increasing the peristaltic movements of the intestine. The respiratory movements were also increased.

*Iodothyryn.*—It had no general action upon frogs. Upon the pulse-rate and arterial tension it had no

marked effect, except a slight increase of pulse-rate at times. It increased the respiratory movements.

*Thyroid.*—In the frog it depresses the reflexes. It lowers the blood-pressure and heart-beat. It accelerates the respiratory movements.

*Pancreas.*—It decreased the pulse and arterial tension.

*Testicle.*—It lowered the pulse and slightly increased the arterial tension.

Upon the temperature nearly all these agents caused an elevation.

### THE WOUNDED OF THE PORTO RICAN CAMPAIGN.

BY N. SENN, LIEUT.-COL. U. S. V.

CHIEF OF THE OPERATING STAFF WITH THE ARMY IN THE FIELD.

The Cuban and Porto Rican invasions have confirmed the experience of the past in showing that the greatest horrors of war are caused by disease and its consequences rather than the implements of destruction. If the battle-grounds are in the extreme north or south, climate enters as an important factor in decimating the ranks and in increasing the sufferings of the contending armies. A war of invasion requires more preparation, foresight and forethought on the part of those who plan and conduct the campaign than one of defense, a fact we have been painfully made aware of during the last two months. The more remote the seat of conflict, the more difficult the task of providing food and clothing for the army, and the more serious becomes the problem of properly caring for the sick and wounded, and the greater becomes the difficulty in returning the survivors to their homes. Nostalgia, a very common affection among unseasoned troops, becomes more prevalent in proportion to the distance between home and the seat of war, as we had abundant opportunities to observe during the late war. The depressing effect of this common ailment has a decided influence in increasing the rate of mortality of the sick and wounded, and in impairing the effectiveness of the fighting line. Nostalgia is a contagious disease, not in the sense we use the word contagion ordinarily, but when once established in camp it increases rapidly by suggestion. The onset and spread of this common ailment of camp life are promoted by interruptions of the mail service, the only medium of communication between the soldier in the field and his distant home. Among the many sins of omission of those in charge of the management of the late war was a glaring neglect to provide for the much-needed and anxiously looked for mail facilities. If those who have the management of this branch of the government service in charge could be made to understand what an occasional letter will do in keeping up the spirit of the citizen soldier, nostalgia would have been less prevalent and its effects less disastrous during the late campaign. From the time I left Fortress Monroe for Cuba, July 3, and until I arrived in New York from Porto Rico, August 19, I received only two letters of the probable two hundred sent to me during this time. In summing up the casualties of the war just ended, it is safe to make the statement that the number of killed and the number of deaths resulting from the immediate effects of wounds will not exceed 280. The number of wounded will in all probability reach 1425. The number of deaths from malaria, dysentery, yellow fever and typhoid can not be estimated at this time, as these