

The Making of Tablets.

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For many years compressed tablets have grown in popularity until they have become an important item in the sales of every pharmacy. They have recommended themselves to the physician because of their accuracy of dosage and convenience, and these are probably the main reasons for their popularity.

The increasing sale of these goods tends, however, to make the pharmacist more and more dependent on the manufacturer, for but few pharmacists make the tablets they sell.

Why is this so? Is there no money in making compressed tablets? Is the preparation of compressed tablets so difficult as to deter any intelligent pharmacist from making them?

The reason why so few pharmacists prepare their tablets is due probably more largely to a lack of information concerning their mode of preparation than to any other cause, for there is nothing about the preparation of compressed tablets which should deter any pharmacist from preparing his own tablets.

As to the question of profit in making them, does anyone suppose for an instant that so much capital would be invested in plants devoted to their manufacture if it was not profitable to make them? The writer can say from experience that any intelligent pharmacist can prepare these goods in first-class manner, and as he may need them, and not be compelled to carry in stock the many different kinds now in demand. I have never felt kindly towards the idea of a pharmacist buying supplies that he can make himself. This tendency of modern pharmacists to depend on others for laboratory products that they can make themselves is one of the main reasons for the decreased profits we hear so much about.

If the pharmacist will prepare himself to produce his own tablets and give the physician to understand that he will make any combination that the physician may desire, he will find that the sale of tablets will become a source of more profit than if he lent himself to the sale of the ready-made tablets of the market.

In order to make nice tablets the substances to be compressed must be carefully prepared. Not only is this necessary, but the machine used to compress them must be kept scrupulously clean, the dies must be smooth and polished, and free from rust. With a rough die it is utterly impossible to make smooth tablets, and not only is this so, but the material will stick to dies. The dies never should be cleaned with any hard instrument, but with a damp cloth, and then carefully dried and rubbed with cloth slightly greased with petrolatum. If the machine is to be laid aside, the moulds and die and nickel-plated part should be covered with petrolatum; this is absolutely necessary in order to prevent rusting.

When the dies become roughened, as

they will from constant use, they should be carefully polished and made smooth by means of emery flour and oil. This can best be done in a lathe, but can be done by hand. If done by hand a piece of wood should be made of such shape as to fit the face of die, and this used to polish with in using the emery flour. It takes more time than working with a lathe, but the work can be nicely done in this manner. The smoother and more perfect the surface of the dies, the less trouble will be had with material adhering to dies, and the smoother and more perfect the tablet. It can, then, be readily seen that too much attention cannot be given to the care of the moulds and dies.

While some materials compress readily without any special treatment, this is far from the rule. Some chemicals already in granular form are readily made into tablets; by far the greater number, however, must be specially prepared before they can be successfully compressed. It is necessary to add some adhesive to many substances and combinations before they can be successfully compressed.

The adhesives usually used are powdered acacia, powdered sugar, starch, and glucose. Glucose is only used where it is desired to prepare hard tablets for slow solution in the mouth. Prof. Coblentz, in his "Handbook of Pharmacy," says that there are few substances which cannot be successfully compressed after being mixed with five per cent. powdered acacia and ten per cent. powdered sugar. My own experience has fully demonstrated to my mind the utility of this as a general formula.

It should be the aim in preparing tablets to make them as soluble as possible. Tablets made with sugar as an adhesive are more soluble than those made with acacia or even acacia and sugar. Starch is also used to make tablets soluble, but is hardly as advisable as sugar. It has the advantage of taking up a considerable quantity of liquids, and on this account is very useful in such tablets as contain these in such quantities as to be objectionable if made with sugar alone. Powdered acacia should be used in all combinations of a hygroscopic nature.

Some have recommended, in order to insure more ready disintegration of the tablet, that small quantities of bicarbonate soda and either tartaric acid or citric acid be worked into the tablet.

While this would increase the solubility of the tablet and be very desirable in some instances, it has the disadvantage that, in order to incorporate it, the material must have different treatment from regular tablet material in order to prevent the action of the acid and soda before the tablet is made, and then defeat the purpose for which it is added. Again, tablets thus made, if not carefully kept from the air, do not keep. However, the writer believes that in some tablets which are naturally slow of solution it has much in its favor. It is only intend-

ed to use these in very small quantities, not to produce effervescence, but make the tablet disintegrate by the action of the acid in the soda when taken into the stomach.

It has been found that a fine powder does not compress as nicely nor feed as evenly as a coarse one, and on this account it is necessary to carefully granulate the material to be compressed. This is done by carefully mixing the powder and moistening, then passing through a No. 20 sieve and drying, then passing through sieve again. Water is generally used to moisten, although alcohol and solution of glucose are sometimes used. The powder must not be moist enough to stick to sieve. A tinned iron sieve is recommended, but if it were possible to get a tinned brass sieve it would be much better.

It is necessary to have the granulated material thoroughly dry before compressing. If the granulating has been carefully done and the material well dried, it will often be found unnecessary to add any substance to keep the material from sticking to the dies.

LUBRICANTS.

In the great majority of instances, however, it is necessary to add some substance to the granulated material to prevent the powder from adhering to dies. White vaseline, powdered talcum, and powdered boric acid are the substances usually used. The vaseline is best used as a two per cent. solution in ether with an atomizer. The material is granulated and dried, then sprayed with the solution vaseline, and mixed on a paper or stirred with spatula and dried. It is then passed through sieve. If powdered talcum is used it should be added to the dry granulated material, and stirred with spatula, or mixed on a paper, or it can be added to the dried granulated material in a wide-mouth bottle and mixed by agitation. Not to exceed three per cent. (of the weight of the granulated material) of powdered talcum should be used.

Boric acid is used in the same manner as talcum, but not to exceed two per cent. should be used. It is only used in making those tablets where a perfect solution in water is desired, such as in hypodermic tablets.

Sometimes it is necessary to use both vaseline and talcum; the talcum is then added last, after the vaseline, and not until the powder is dry, when it is mixed as directed above.

In preparing tablets it is a mistake to apply too much pressure; only as much pressure as is absolutely needed should be used. Never try to compress a moist powder, for it will stick to dies and not be satisfactory. Do not use any more lubricant than is absolutely necessary.—*The Spatula.*

The oldest United States college is Harvard, founded in 1636.