

cocaine. *Increased susceptibility* to the action of the drug due to its continued administration also occurs. It rarely gives trouble except with those drugs such as Digitalis which can be more readily absorbed by the normal body than they can be excreted by it. *Disease* may readily influence the absorption of a drug on the one hand or interfere with its excretion on the other. For example a large skin-wound may readily absorb a poisonous dose of carbolic acid or iodoform. Or increased acidity in the stomach may lead to a larger absorption of bismuth salts than is normally the case. Diminished excretion by the kidney will lead to a more prolonged action of strychnine.

Secondly, the doses of the pharmacopœia are doses for adults. For children much smaller doses must be given. The rule suggested by Young is perhaps the best for calculating the dose for a child. Multiply the adult dose by the age of the child and divide by the age of the child plus 12. Thus for a child of three, the dose would be $\frac{3}{3+12}$ or $1/5$ th; for an adult dose of 15 min. it would be $\frac{15 \times 3}{3+12}$ or 3 min. Another rule suggested by Brunton is to multiply the age at the next birthday by the dose and divide by 25 (the assumed adult age), or perhaps better multiply the dose by four times the age at the next birthday and divide by 100; for the example stated above that would be $\frac{4 \times 4 \times 15}{100}$ or 2.4 min. roughly $2\frac{1}{2}$ min. Young children are particularly prone to be affected by morphine and its allied drugs, but are proportionately little influenced by atropine, strychnine, and alcohol.

Persons above the age of sixty are proportionately more affected by drugs than are younger persons, so that by adults must be understood persons between 20-60 years of age. Persons over 60 should receive roughly $\frac{3}{4}$ and persons over 85 roughly $\frac{1}{2}$ of the adult dose, save in the case of purgatives to which the aged are often very refractory.

Thirdly, the frequency of repetition makes a great difference in the size of dose to be administered. The more frequently the drug is to be administered the smaller the dose should be.

Fourthly, the time of day makes as a rule but little difference, except with the case of drugs meant to bring on or increase a normal daily condition. For example a larger dose of a hypnotic such as chloral would be necessary to produce sleep during the day than at night. Also purgatives can best be given at such an hour that they will take effect at the hour of the patient's daily defecation. For this purpose calomel and aloes must be given some eight hours in advance, while purgative salts act within an hour or so.

The presence or absence of food in the stomach makes a great difference in the rapidity with which drugs are absorbed and in the quantity coming in contact with the wall of the stomach and so irritating it, and as a consequence of this larger quantities of any drug irritant to the stomach may be given immediately after than before meals.