students' personal opinions as to whether this should or should not be done. This sort of training is necessary since pharmacists may encounter such problems and be requested by the physician to correct the incompatibility. In addition some State Boards are giving such mixtures and expecting a product, showing the art of Pharmacy in all its glory.

Finally, let me state why I object to teaching "Incompatibilities" from a test-tube. Since we cannot show every type of incompatibility and, even if we could, no one could remember them all, why should we try? Since we are really trying to develop self-confidence, resourcefulness and logical reasoning, why should we waste valuable time to show reactions in a test-tube that the student may or may not associate with dispensing pharmacy? Would it not be better to show the most common types of prescriptions, reasons for the technic employed in properly compounding these and as many others as time will allow, filled from start to finish just as they would be in actual practice? After all the student, who must be guided in later years by reactions in a test-tube, has not been educated—he has been stuffed with facts. He cannot predict a reaction of a new mixture by pyramiding his fundamental sciences—he can only wish that it were like one he had seen in a test-tube back in his college days.

SOME FALLACIES OF QUANTITATIVE BIOLOGICAL TESTING.

BY H. H. RUSBY, M.D.

Students of our Pharmacopœia note that on page 126, under the heading Digitalis, the lethal frog dose of the ten per cent tincture is fixed at six thousandths of a cc. per Gm., while on page 359, that of the ten per cent tincture of Strophanthus is given as six hundred thousandths of a cc. It must be admitted that the toxic power of the Strophanthus tincture, thus indicated, is one hundred times as great as that of the Digitalis tincture. As neither of these tinctures is used in practice for the purpose of killing frogs, it must be assumed that the purpose of these frog standards is to indicate the "Therapeutic usefulness" of the respective drugs. One of them, the Digitalis, being one one-hundredth as active as the other, should be given in a dose one hundred times as great; that is, eight hundred minims or more than an ounce and a half, of the tincture. Or, if we assume that the designated dose of digitalis is correct, then, to preserve the pharmacological parity, the dose of Strophanthus tincture should be reduced to eight hundredths of a minim. Even if we decide on a fifty-fifty compromise, we should get four hundred minims, nearly 7 fluidrachms, for the digitalis, while the dose of strophanthus would be sixteen-hundredths of a minim. The doses actually stand at 15 minims and 8 minims, respectively. Are our practitioners of medicine this far off in their dosage, or is it true that the power of the drug to kill a frog has no quantitative relation with its usefulness as a human medicine? What is to be done about it?

We are told that both inefficiency and uncertainty in the action of strophanthus are due to the slowness of its absorption from the stomach, thus necessitating this large dose, as compared with digitalis, but I reply by referring to the fact that the tincture is directed to be made from the seeds of either *S. Kombé* or *S. hispidus*, or

any mixture of them, whereas only *S. Kombé* contains strophanthin, which is designated as obtained from that species. *S. hispidus* contains only pseudo-strophanthin.

Turning to digitalis itself, we find a general complaint of its inefficiency and variability in recent years; so much that its use has perceptibly declined, yet I am able to say that there has been no change in the general character of the drug in use from that of the previous decade. It seems clear that this result is due to reliance having been placed upon an untrustworthy test.

McDonald and Schlapp (*Quarterly Journal Pharmacy and Pharmacology*, for July to September) say that the effect of the digitalis on the brain so modifies its heart action that the cat (he prefers the Hatcher Method) should be subjected to a complicated series of surgical operations to eliminate this influence before the test is applied. But the patient is not placed under this condition when taking the medicine.

Messrs. Haag and Hawkins, in the December number of THIS JOURNAL, refers to the difficulty in the chemical assay of aconite tincture, and therefore approves of the substitution of the biological assay with guinea pigs. They admit, however, that a large number of animals is required for the test. Now comes Dyer, in the December number of the *Quarterly Journal of Pharmacy and Pharmacology*, and reports a very extended investigation with rats and mice, involving the use of more than 1000 animals, comparing the biological results with those of chemical assay of the ether-soluble alkaloid. He declares that the results are so closely similar as to be called "uncanny." It seems, then, that in this case both methods are accurate, if the operator is qualified, yet our Pharmacopœia has dropped the chemical assay, the appropriate method for the pharmacy laboratory, and has substituted the biological test, which no pharmacist will be in a position to use, even if competent to do so. What we are trying to do is to determine life-saving values by the use of an inconstant and variable unit of measure, and then guessing at the extent of our error. The effect is to prevent the pharmacist from making and testing his own tincture of aconite.

THE GROWING IMPORTANCE OF PROFESSIONAL PHARMACY.*

BY H. C. CHRISTENSEN, PRESIDENT, A. PH. A.

Retail pharmacy has awakened to the fact that the professional aspect is its best asset. During June and July of last year I attended pharmaceutical conventions in ten states and was pleased to find that the keynote of the presidents' addresses, as well as numbers of speeches and papers, placed emphasis on the professional side of pharmacy.

This reversion to type is not strange. What is strange is our temporary wandering away from the path we had trod for ages, and our emulation of certain cigar, sandwich and cut-rate emporiums that we thought had found the quick road to success. We envied them the volume of business they were doing without realizing the loss of prestige incurred. Absentee ownership, as usually practiced by these super-merchandising establishments, has not as yet been proven a success.

What awakened us to the realization of the advantages to be gained by more attention to the professional duties we had been neglecting? The steady loss of public respect and confidence no doubt played a part. Perhaps the joke page helped. Maybe when we read about the person

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