acid, and titrate back with N/50 alkali, using cochineal as indicator. Each cc. of N/10 acid neutralized by the alkaloid corresponds to 0.0315 gram (0.031483 gram) of codeine alkaloid or 0.039 gram of codeine sulphate U. S. P.

That all of the codeine and practically none of the morphine is extracted by this method was proved in several cases by repeating the extraction of the aqueous residue containing the morphine. The N/50 alkali required in the titration being in every case within 0.1 cc. of the amount required to neutralize the N/10 acid used.

The presence of 0.9 percent. to 7 percent. of codeine in the morphine sulphate being consumed in the United States at the present time is certainly very surprising. This condition of affairs is to be directly attributed to the lack of any test in the United States Pharmacopœia which will show the presence of several percent. of codeine in morphine sulphate. It is a condition of affairs arising from the lack of any test which would show the purity of the product, and not from any desire to market a sophisticated product, this being evident because codeine is a more valuable product, commercially, than morphine, and is readily separated from the latter. Manufacturers would certainly not allow the codeine to remain in their morphine sulphate at a loss to themselves, and at the expense of an inferior product.

In the manufacture of morphine sulphate the morphine is usually precipitated as the alkaloid from a large volume of water, enough to hold in solution several times the amount of codeine present. Some experiments showed that it was not possible to completely separate codeine from morphine in this way, and that part of the codeine is apparently carried down with the crystals of morphine, perhaps being isomorphous with the latter.

In order to avoid the presence of codeine in morphine sulphate in the future, the next edition of the United States Pharmacopœia should include a quantitative test for codeine in morphine. The test outlined above or some suitable modification of this test is suggested. A limit of 1 percent. or 1.5 percent. should also be established as the maximum amount of codeine allowable in morphine sulphate.

ANALYTICAL DEPARTMENT, PARKE, DAVIS & Co., Detroit, Mich., July 17, 1912.

DRUG DETERIORATION.

For years, those interested financially, in cold-storage warehouses and cold-storage products, have been trying to convince the public that, if the keeping of meat, fish, eggs and so forth in cold-storage did not actually improve the quality, it at least had no deleterious effects on the products. Recognizing that products could not be improved by cold-storage but that there was considerable danger of deterioration and believing that the public has a right to know the truth, state legislatures are enacting laws which require that for cold-storage products the duration of such storage be declared on each parcel.

Similarly, while pharmaceutical manufacturerers, in general, are attempting to convince us of the permanence of their pharmaceutical products, it is being recognized more and more that there are a considerable number of drug products which are liable to suffer more or less seriously with age. In commenting on ex-

periments which have been made by Pittenger and Vanderkleed to preserve fluid-extract of ergot by sealing it in glass ampules, the Journal A. M. A. (Sept. 21, 1912, p. 959), says:

"The investigation of Hale on Digitalis, of Edmunds and Hale on ergot, and Dohme on calabar bean, coca and aconite, have revealed the fact that many drug preparations deteriorate, and that drugs are often several years old when they reach the patient. These facts have been emphasized, also, through a report of the Council on Pharmacy and Chemistry dealing with the testing of epinephrin solutions in which the Council recommends that 'manufacturers stamp the age of manufacture on the container, to guard against samples which are obviously overaged.' Naturally some manufacturers have asserted that the reported deterioration is accidental, or have tried to put the blame on the pharmacist. Some have shifted their previous claims as to strength in such a way as to avoid responsibility. Some firms, however, instead of attempting to dodge responsibility, are doing what ought to be done, and indicate the date of manufacture on the label of those preparations which are prone to deterioration."

Although many medical preparations no doubt are relatively permanent, it is not unfair, in view of the lack of definite information on the subject, to ask that the date of manufacture be placed on all labels of medicines. As manufacturers quite generally put on each package of a given preparation a number which identifies the "lot" from which the particular product is taken, such a system of dating would impose no extra expense to the manufacturer. It would merely supply information to which the physician, the pharmacist and the public all are entitled.—*Texas State Jour. of Medicine.* (Oct. 1912, p. 159).

DETERIORATION OF SPIRIT OF NITROUS ETHER.

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Spirit of Nitrous Ether, commonly called Spirit of Nitre, is defined by the Eighth Revision of the United States Pharmacopœia as "An alcoholic solution of Ethyl Nitrite yielding, when freshly prepared and tested (by the method given in the U. S. P.), not less than 4% of the Ethyl Nitrite."

That this 4% of ethyl nitrite is easily lost under improper conditions is a matter of common knowledge among those who have anything to do with this preparation. Reports of various state departments charged with the enforcement of the drug laws show that this preparation has caused more or less trouble. It appears that the fault lies mainly in the manner in which it is stored. In the state of Michigan the records of the laboratory show that during the year of 1912 over 72% of the samples examined were found to fall below the required standard of the U. S. P.. When some of the manufacturers of these preparations were asked to explain why their spirit of Nitrous Ether did not conform to the U. S. P. their reply was that it is impossible to keep such a volatile preparation for any length of time and have it of standard strength. However, investigation into