

ments were conducted with several materials in order to compare the physical constants given in the U. S. Pharmacopœia for a number of volatile oils with the constants determined on similar oils freshly obtained with the apparatus described above. The results obtained are given in Table II.

TABLE II.—PHYSICAL CONSTANTS OF VOLATILE OILS GIVEN IN THE U. S. P. AND PHYSICAL CONSTANTS OF SIMILAR OILS OBTAINED BY THE NEW METHOD.

Material.	Physical constants (U. S. P.).			Physical constants (determined). Spec. grav. 25° C.		
	Specific gravity.	Optical rotation.	Refractive index.	25° C.	Opt. rot.*	Ref. ind.*
Nutmeg (seed)	0.859-0.924	+12°-+30°	1.4780-1.4895	0.874	+30°	1.480
Caraway (fruits)	0.900-0.910	+70°-+80°	1.4840-1.4880	0.904	+73°	1.485
Eucalyptus (leaves)	0.905-0.925	± 10	1.4600-1.4690	0.912	+6°	1.464
Fennel (fruits)	0.953-0.973	+12°-+24°	1.5280-1.5380	0.963	+18	1.529
Clove (buds)	1.038-1.060	Does not exceed -1°-10'	1.5300-1.5350	1.053	-0.6°	1.533
Orange (peel)	0.842-0.846	+94°-+99°	1.4723-1.4737	0.844	+95°	1.471**

* Room temperature, approximately 24° C.

** Within U. S. P. variation recognized as occurring in distilled oil.

These results show that the constants obtained on these volatile oils are within the limits given in the U. S. Pharmacopœia for similar volatile oils.

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THE BOYCOTT OF SPANISH ERGOT.

BY H. H. RUSBY.

In the *Second Annual Report of the Pharmacological Laboratories of the Pharmaceutical Society of Great Britain*, page 10, occurs the following statement regarding their assays of extracts of ergot, "prepared by the method of the United States Pharmacopœia."

"An important practical conclusion was reached that, whereas most samples of Spanish or Portuguese ergot contain a fair proportion of the specific alkaloid, samples of Russian and Polish ergot are uniformly deficient."

Gittenger and Munch, of the U. S. Dept. of Agriculture, have reported that 26 of 27 samples of Spanish ergot were equal to or above U. S. P. requirements and 6 Portuguese samples were the same, while 3 of 5 from Poland and 7 of 9 from Russia, were below U. S. P. requirements.

The representative of a German firm that makes a specialty of the manufacture of *ergotamine*, now regarded as the principal active constituent of ergot, recently informed me that they were unable to produce this alkaloid from Russian ergot in any paying quantity.

Some weeks ago, in my office, a gentleman representing a combination of certain drug dealers, pharmaceutical manufacturers and pharmaceutical journals, said to me "We have succeeded in preventing a market for Spanish ergot."

Beyond saying that this declared boycott of Spanish ergot is part of a dollars-and-cents competition among commercial interests and their sponsors, I shall here confine myself to the indisputable facts regarding the comparative characters of Spanish ergot and any other kind that is available to American manufacturers.

My knowledge of this subject has been very intimate and extensive for more than a quarter of a century. I have examined and approved or condemned trainloads of ergot, in the aggregate, and cannot plead ignorance regarding the subject here discussed. Either the statements are true, or I am deliberately misleading the readers of the JOURNAL.

Of all the lots of Spanish ergot that I have ever examined, I believe that I have never seen one that did not comply with the present requirements of the Pharmacopœia. It is true that in earlier years there was no biological test, but there is no reason to believe that any ergot meeting the other requirements will fail to meet this test, properly applied. I have no doubt that inferior lots of Spanish ergot exist but this must be very unusual, as I have never seen them. Practically all ergot other than Spanish (including Portuguese) that is offered here, is Russian (including Polish), although much has gone out through other countries, including Spain, in order to give it a fictitious standing. Some of the worst of it is said to have gone from this country, after being rejected by the Government, been "fixed up" on the other side, under instructions from our own importers, and successfully returned to this country. I have seen Russian ergot of fair quality, but never actually good, and only rarely fair. An account of the characters of these two products follows, but at this point, I desire to secure the attention of the reader to the full force of the claim that the Spanish ergot has "been deprived of a market" here, in view of my introductory quotations.

Spanish ergot is uniformly collected, cleaned and picked over with scrupulous care, is dried as the Pharmacopœia directs and stored by special devices to keep it dry and unchanged. It is packed and shipped, usually in lined cases, so as to exclude all dampness, and it arrives in perfect condition. Moreover, it probably is not true of this ergot, as stated in the U. S. P., that it is "unfit for use if kept more than a year," though this is true of Russian ergot, long before the expiration of the year.

To describe Spanish ergot would be merely to quote the text of the U. S. P. It is true that worms are occasionally found in it, but it is certainly "as free as practicable" from animal matter.

The collecting, cleaning and picking over of Russian ergot is subject to the

carelessness and uncleanness that characterize the Russian peasant. Many grains of nonergotized rye are always contained, and a still larger number of "immature" grains, that is, grains that have become only partially ergotized. So far as my experience goes, it is never properly dried and is often apparently shipped without any drying whatever. I have received it so wet that it seemed as though it had been dipped in water to increase its weight. It is almost invariably packed in bags which are permeable to dampness, and also to various impurities and to insect invasion. Under these conditions, certain processes of deterioration begin immediately. The interior of the mass heats and ferments. The fat decomposes and rancidity develops. The whitish fracture may become brownish and the texture may become soft, even mushy, and an offensive odor develops. The damp and heated state is very favorable to the hatching of ergot worms and to the multiplication of mites, known as "lice." The worms, forming their cocoons, produce the "webby" ergot. The lice appear in incalculable numbers. Each is as small as a minute speck of dust, but they frequently cover the entire surface of the grains so as to give them a gray-brown color. Hundreds will be upon a single grain. They become brushed off and accumulate in the bottom of the bag, where I have found them by the quart. More or less moldiness is always present, sometimes so excessive as to cause the grains to cling together in a damp gray mass.

Such is the ergot—practically the only ergot—that will be used by the American people, if the boycott of the Spanish product is not stopped, and its success is being promoted by one of the most powerful combinations that I have ever seen at work in the pharmaceutical world, and is receiving strong journalistic support. It must be a very bad case of mental strabismus that refuses to accept such testimony as that which I have quoted in my introduction.

The condemnation of such ergot is found in the U. S. P. itself, which says there must be "no moldiness" and that the ergot must be "as free as practicable from insect material," that it must be free from rancidity or abnormal odor, and that it must meet various other physical requirements, none of which are met by other than Spanish ergot. If it does not meet all these requirements, the Pharmacopœia, on page 4, specifically forbids the making of preparations from it. In addition to all the other defects named, the Russian ergot offered during the latter part of 1927, or a large part of it, has been held back by the Soviet government for one or more years, to await higher prices. This alone excludes it from admission, because the Pharmacopœia says that it is unfit for use if kept for more than a year. Kept under the conditions above described, there is no question that it is unfit. It is now reported that the Soviet government has forbidden the export of the recent crop, until the old stock shall be disposed of.

In order to deceive and mislead Government officials, a regular business has grown up in New York City of "re-conditioning" it. It is brushed and scoured so that its moldiness is not seen unless one looks into the grooves, or beneath the surface. It is dried, winnowed and sifted so that most of the animal matter is removed. So skilful have these artists become that they have proudly boasted that "ergot cannot be so bad that we cannot fix it so that it will pass inspection." What they cannot do, however, is to restore the lost alkaloid or remove the objectionable probably toxic decomposition products that have formed.

The unenlightened reader may wonder how even a nominal defense can be made of such practices. It is to be found in the fact that among the other U. S. P. requirements is one that the fluidextract must darken the cock's comb when tested as prescribed. Since the Pharmacopœia says "Preparations shall be made only from drugs meeting the physical descriptions and tests," it is clear that there should not be any fluidextract made from such ergot as I have described, but the fact is that the practice has grown of disregarding every other requirement except this one. Things have even gone so far that when the fluidextract does not show the required strength, the official formula is changed so as to use a larger amount of drug to produce the liter of fluidextract! And the defense for this is that it is not yet proved that a fluidextract that darkens the comb is not necessarily active therapeutically!

That physicians should take little interest in this matter is not surprising. Not one in a thousand of them knows the difference between grains of ergot and licorice drops, and too few of them are observant of the effects of the medicine when administered. But with the pharmacist, the case is very different. He is directly responsible for the merits of a fluidextract used in a prescription, regardless of whether it is of his own manufacture or not. With the knowledge that *ergotamine* cannot be extracted in quantity from Russian ergot, and that the British Pharmacopœial Laboratories have found it "uniformly deficient in the specific alkaloid," and that the U. S. Department of Agriculture have found that 10 out of 14 samples of Russian ergot were without appreciable activity, American pharmacists should recognize that their own interests, quite aside from those of their customers, are endangered by a continuance of the determination of certain American manufacturers to "prevent a market for Spanish ergot," and compel the use of the Russian article, in plain violation of the Pharmacopœia and the statutes.

CARE OF ANIMALS FOR BIOLOGIC ASSAYS.

(Continued from p. 257, March JOUR. A. PH. A.)

BY PAUL S. PITTENGER.

FROGS.¹

Distinction of Batrachians from Fishes and Reptiles.—"The Batrachians represent a Class of Vertebrate animals occupying a position between Fishes and Reptiles. There is considerable variation in general appearance among the different living members of the Class, so that a Batrachian is not as easily defined and identified as is a fish, a bird or a mammal. There is no one characteristic by which it may be known, as there is in each of these other Classes."

Two Orders of Living North American Batrachians—Urodela and Salientia.—"The living North American Batrachians differ enough to allow classification into two distinct Orders, the Urodela and the Salientia. The Urodela are the Tailed Batrachians, or Salamanders, with various popular names, such as Mud Puppies or Water Dogs, Tritons, Newts and Efts. The Salientia are the Tailless Batrachians, *i. e.*, the Toads, Tree Frogs, Frogs and all Batrachians that have the frog-like form."

¹ Quotations from "The Frog Book" by Mary C. Dickerson.