The assay showed the presence of 30.547% non-volatile, ether-soluble extractive.

B.—Another sample of 0.500 Gm. was placed in a 100-cc. beaker, 20 cc. of ether added, the material stirred by means of a glass rod for about ten minutes, and then allowed to stand for about one hour when it was poured on a filter. The filtrate was collected in a tared glass crystallizing dish. The filter and contents were then washed with ether employing about 75 cc. in all. After evaporation of the ether, the dish and contents were weighed.

The presence of 30.600% of non-volatile, ether-soluble extractive was indicated.

In an effort to determine whether these findings, which checked closely, represented the actual amount of ether-extractive, I made two assays employing two Soxhlets, following the U. S. P. directions with reference to twenty hours continuous extraction, ether, etc.

C.—Employing a Soxhlet with a stop-cock on side, an Allihn condenser and all ground joints.

The assay indicated the presence of 37.032% of non-volatile ether-soluble extractive.

D.—Employing a Soxhlet, which did not have a glass stop-cock on side, had a Hopkin condenser and all ground joints.

The assay indicated the presence of 37.023% of non-volatile, ether-soluble extractive.

SUMMARY.

These figures clearly indicate that in order to obtain accurate results in the determination of non-volatile, ether-soluble extractive of flaxseed it is necessary to follow the method of the U. S. P. and employ some type of continuous extraction apparatus.

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AUSTRALIAN SANDALWOOD OIL COMPARED WITH THE OFFICIAL.*

BY EDWARD SWALLOW.

The various kinds of sandalwood oils, from other sources than the East Indian, or official Sandalwood Oil, which is obtained from *Santalum album*, have caused more or less confusion in the minds of both the pharmacists and government authorities in most countries of the world.

Generally speaking, most of the foreign pharmacopœias recognize only the sandalwood oil that is distilled from the wood of the *Santalum album;* therefore, it follows that in the countries where this drug is recognized as the source of the official oil, other oils obtained from other woods may not be used for the recognized product.

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* Presented to Scientific Section, A. PH. A., Portland meeting, 1928.

As the santalol content is the chief medicinal constituent of the official drug, and the standard requirement of most pharmacopœias calls for not less than 90 per cent of this constituent, the "Sandalwood Oils" that do not contain santalol, or contain a lesser percentage of it, evidently are mis-named. On the other hand, any sandalwood oil obtained from a recognized species of *santalum*, such as the Australian sandalwood oil, that is distilled from *Santalum spicatum*, having a 90 per cent to 94 per cent santalol content, would appear to meet the legal requirements of this drug, even though it is obtained from a non-official variety of sandalwood.

From a medical standpoint, the difference existing as to the particular source of Australian sandalwood oil, obtained from *Santalum spicatum*, and the East Indian sandalwood oil, distilled from *Santalum album*, does not matter when the two oils are considered as therapeutic agents, and that is all the medical profession is concerned with.

This Australian sandalwood oil has received the endorsement of the medical profession in Australia. A recent report from a leading specialist in venereal diseases in London, England, not only supports this endorsement, but states that this Australian sandalwood oil is equal in medicinal value to the official sandalwood oil and is better tolerated by the patients.

Professor Emilé Perrot, of Paris, France, has examined this particular Australian sandalwood oil, and reports that "the oil of Australian sandalwood, *Santalum spicatum*, seems to give identical results, medicinally, with the oil of *Santalum album*, with the added advantage of being, in general, better tolerated by the patient."

Dr. Percy May, of London, reports on this Australian sandalwood oil as follows:

"Although such properties as optical rotation are interesting to the chemist, as tending to throw some light on the chemical relationship of the oils from different sources, the crucial question from the pharmaceutical point of view is that of therapeutic effect. If West Australian sandalwood oil is found in practice to be as effective, medicinally, as the East Indian oil, then there can be no good reason why it should not be included in the pharmacopœias of the world, in view of the fact that the uniform quality of good commercial oils enables a specification to be drawn up to exclude all but the good oils."

It may be well to point out that certain producers of Australian sandalwood oil, distilled from *Santalum spicatum*, have arranged with the Australian government authorities through the General Control of Customs, Melbourne, to standardize all of this particular kind of oil before being used in Australia or exported. Such Australian sandalwood oil, obtained from *Santalum spicatum*, has a guarantee of purity and quality that, in addition to its santalol content being constant and more than meeting the requirements of the official sandalwood oil in this respect, justifies its inclusion in all pharmacopœias, either as a separate item or included in the legal requirements covering the East Indian sandalwood oil.

The suggestion is offered—that as this Australian sandalwood oil is the equal in medicinal value to the official sandalwood oil, and guaranteed by the Government as to its purity and strength and freedom from adulteration—"Medicinal Sandalwood Oil," should include both the East Indian oil, and this standardized Australian sandalwood oil, so that either may be used in medicine.

The writer, an experienced hospital pharmacist, is of the opinion that the physician, when prescribing for his patient, has only one thought—the action of the drug he orders. Differences in rotations, and the fact that one drug may be obtained from one member of a certain family, and another from another member of the same family—both having a common botanical origin—does not interest the physician; he wants results.

There is no doubt about this Australian sandalwood oil being fully equal in medicinal value and therapeutic effect to the official sandalwood oil and, moreover, is better tolerated by the patient. The mere fact—that owing to sandalwood oil being introduced into medicinal use from India, where in the regions of Mysore, and other territory, "the rulers of the country have from time immemorial, exercised a monopoly over *Santalum album* and its oil"—should not prevent the legal use of Australian sandalwood oil as a recognized medicine, if it meets the requirements of the medical profession in therapeutic value.

In regard to the chemical constituents of the official sandalwood oil, distilled from *Santalum album*, the percentage of santalol furnishes the basis of the official test; therefore, the following analyses made by various well-known chemists, and one from the Australian Government Customs Control, are presented.

SANTALOL CONTENT OF AUSTRALIAN SANDALWOOD OIL.

Seil, Putt & Rusby, New York	Percy May, London	Australian Customs	W. H. Simmons, London	Requirements of U. S. P.
1928	1918	1927	1927	
94.65%	90–96%	92.5–96%	95%	90%

The conclusion is reached by the author that, as the value of sandalwood oil as a medicinal agent depends entirely on its santalol content, Standardized Australian sandalwood oil, obtained from *Santalum spicatum*, should receive recognition in the Pharmacopœia so that it may be legally used as a medicine in the United States.

SILVER-ION CONCENTRATION OF COLLOIDAL SILVER GERMICIDES, III.*

THE TITRATION OF SOLUBLE IODIDES IN COLLOIDAL SILVER IODIDE.

BY RALPH B. SMITH AND W. G. CHRISTIANSEN.

That colloidal silver iodide contains a small excess of free sodium iodide is evident when one considers that the p_{Ag} of colloidal silver-iodide preparations as will be shown in this paper is between 12.5 to 14.0 and the silver-ion concentration of pure silver iodide as was shown in the first paper of this series[1] is equivalent to a p_{Ag} of 7.95. It is also possible to demonstrate the presence of soluble iodides by dialyzing the silver-iodide preparation against distilled water in a beaker and titrating the dialysate but this method has never given satisfactory results.

Previous work[1] had shown that it was possible to obtain smooth curves when colloidal silver preparations were titrated with soluble iodides using a silver elec-

* Scientific Section, A. PH. A., Portland meeting, 1928.

[1] JOUR. A. PH. A., 14 (1925), 10.