

Our presence here to-day attests to our belief that we should in due course of time become a metric country. And now that we have come together, what are we going to do? It would be the worst of blunders if we, representing such diversified occupations, should not, before we separate, form a permanent organization aimed to disseminate the metric gospel among the commercial bodies until they too agree with us that it is high time for this country of ours to throw off the shackles of an Elizabethan set of standards and add our 110,000,000 people to the 437,000,000 already using the metric system.

COMPARISON OF MEDICINAL, MINERAL OILS—RUSSIAN AND AMERICAN.

BY W. F. ODOM AND W. W. DAVIES.

It has been heralded widely in the magazine articles, newspaper advertisements, and other literature of the day that Liquid Paraffin, whether it be a Russian or an American Oil, finds its value as a medicinal agent in its chemical inertness—because it acts merely as a lubricant of the intestinal tract. This point seems to be conceded by all those European scientists who have devoted their time and energy toward research work on this subject, and it is now the only idea fostered by those interested in Liquid Paraffin in this country.

With this in mind, then, we will endeavor to show that the Russian Oil, for clinical, chemical, and physical reasons, is better than the American Oil now found on the market.

CLINICAL OBSERVATIONS.

It is a well-known fact that the European physicians and scientists were the first to prescribe and recommend Liquid Paraffin. After experimenting with the Russian Oil, Sir W. Arbuthnot Lane, the English scientist whose articles are being quoted by many of the promoters of American Oil in their pamphlets and advertising matter, wrote: "The treatment, other than operative, of chronic intestinal stasis of the defective drainage scheme consists in the use of paraffin before each meal. This precedes the food in its passage along the canal and facilitates the effluent."¹ We might quote from a long list of others, among them Phillips, Ross, and Cropper, all Europeans, whose research work into the subject is being applied by many to the American Oil, whereas the data on which they based their articles were obtained from the Russian Oil. The facts of the case then tend to show that the clinical observations on which the use of Liquid Paraffin is based were made with the Russian Oil—and that it is yet to be proven that the same claims are applicable to the American Oil.

CHEMICAL COMPOSITION.

In considering the chemical composition of the two oils, we learn that the Russian Oil is composed almost wholly of naphthene hydrocarbons, which are most probably, saturated cyclic compounds of the hexamethylene type. The American Oil, on the other hand, is mainly methane hydrocarbons with some olefines. They have then totally different structural formulas and, of course, for this reason one will find them acting differently in chemical reactions. The

¹ Page 409, *Hygienic Laboratory Bulletin* 98, U. S. Public Health Service.

hydrocarbons of the hexamethylene type, such as are found in the Russian Oil, are particularly inactive and the saturated methane hydrocarbons of the American Oil are similarly inert, but the olefine series, which the American Oil contains, are reactive even in a weakly acid solution such as might be found in the digestive tract. In fact, Ross claims that the olefines of the American Oil are undesirable in an oil used for internal purposes because they enter into combination with bodies of an acid nature, or with substances in the alimentary tract—whereas, as previously stated, the value of Liquid Paraffin lies in its chemical inertness. We would conclude then that the chemical composition of the Russian Oil makes it the superior of the American Oil, because the other chemical properties of mineral oils, such as sulphur, carbonaceous, or acid impurities, depend only on the method and extent of refining.

PHYSICAL PROPERTIES.

The physical properties of a mineral oil, whether Russian or American, do not seem to bear any relation one to the other.

The "bloom" noticed on many oils is dependent again on the method and extent of refining, and now there are very few medicinal oils—Russian or American—on the market in which the "bloom" has not been eliminated.

The specific gravities may or may not be the same for the two oils. Generally speaking, however, the Russian Oil has the higher specific gravity. This property in no way determines the actual medicinal value of an oil.

The "cold test" is a simple test which a physician or druggist may use to distinguish between the true Russian and American Oils. The Russian Oil will stand a "cold test" of 0° F. or below without congealing. The American Oils, on the other hand, seldom go below 15° F.—many are solid at 20° F. or higher, and invariably are clouded before reaching the congealing point. This test in itself shows that there is a difference in the chemical composition of the two oils and is explained by Gane² when he says that "the higher paraffins in solution in the American Oils, as at present manufactured, are thrown out when the oil is cooled and for this reason American Oil has no cold test." In a series of tests made by one of us on widely advertised American Oil, it was found that, when the oil clouded on cooling, it was necessary to raise the temperature considerably above that at which the cloudiness appeared before the oil was again completely liquefied, thus indicating that the solid paraffins might be considered present in the form of an impurity and that the American Oil had not been refined to the fullest extent. When, in the course of the experiments, the higher paraffins which caused the cloudy appearance were removed by carefully cooling and filtering it was found that the viscosity of the remaining oil was considerably lower, this again indicating that if the oil had been refined to the same point as Russian Oil (medicinal) the difference between them would have been even more marked than is noted in the table which follows.

The value of an oil as a lubricant largely depends upon its viscosity. The engineer in selecting an oil for his engine picks out one with a high viscosity test. The thoughtful physician of to-day sees that the same thing applies to an oil chosen to lubricate a part of the human machinery, and now it is generally conceded that

² JOUR. A. PH. A., July, 1915, p. 792.

the high viscosity test Liquid Paraffin is the best for internal use. In fact let us quote from the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION where it states: "The importance of the viscosity of liquid paraffin is engaging the attention of medical men. *The London Lancet* has shown that the viscosity is more important than the specific gravity, for, whereas the specific gravity may be the same for different samples, the viscosities vary considerably. The higher the viscosity, the more suitable is the oil for medical use as an internal lubricant." (From page 1513, Dec. 1915.)

With this point uppermost in your mind we will present a table in which we have tabulated carefully results obtained by us in our own work with Russian and American Oils. The viscosity was obtained by the Engler Viscosimeter. We are also including in the table, for comparative purposes, the specific gravities and cold tests.

Two samples of Russian Oil and two samples of American Oil were used in these experiments. The Russian Oils were from two very distinct sources of supply. The American Oil No. 1 and No. 2 were obtained from the same source, No. 1 being extensively advertised to the public, while No. 2 was supplied in bulk only.

	Sp. Gr. at 59° F.	Cold test.	Viscosity at 68° F. (Engler).
American Oil No. 1.....	0.8480	Clouds at 40° F., Congeals at 30° F.....	5.4
American Oil No. 2.....	0.8520	Clouds at 18° F., Congeals at 14° to 16° F.....	4.71
Russian Oil No. 1.....	0.8600	Congeals at 0° to -2° F.....	4.26
Russian Oil No. 2.....	0.875	Congeals at -4° F.....	10.26

We may first glean from the above table that although the specific gravities of American Oil No. 1 and No. 2 are not widely different, we can obtain positive proof of their structural difference by the cold test. The viscosity of the American Oil supplied the public seems slightly higher than American Oil No. 2. In comparing the Russian Oils, we note that these samples did not cloud before congealing, also that of the two Russian Oils, No. 2 is of higher specific gravity and viscosity. Again, it is interesting to see that American Oil No. 1, although having a lower specific gravity than Russian Oil No. 1, has a somewhat higher viscosity—this bearing out the statement already quoted from the *Lancet*.

In concluding, we will summarize by stating that a Liquid Paraffin which has undergone extensive clinical investigation, is free from olefins or other active substances, and which is of a high viscosity, should serve as the best medicinal lubricant for intestinal stasis.

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THE OPPORTUNITY FOR DEVELOPING HISTORICAL PHARMACY COLLECTIONS AT THE NATIONAL MUSEUM.*

BY FREDERICK L. LEWTON.¹

I have been asked to speak to you on the opportunity for developing the historical pharmacy collections at the National Museum. It might be well, even

* An address delivered to the Washington Branch of the American Pharmaceutical Association, January 31, 1917.

¹ Acting Curator, Division of Medicine, U. S. National Museum.