

ON BUTTER TESTING.

BY DR. J. SKALWEIT (*of Hanover*).*

ALEX. MÜLLER calls attention to the great number of petitions to various Governments, praying for the prohibition of the sale of mixed butter. The cause of this is chiefly because the present analytical processes used in butter analysis fail to properly identify a mixture unless the proportion of foreign fat be large. Müller now makes two proposals to test by physical means:—

1. *By Dialysis*.—It admits of no doubt the glycerides of the soluble butter acids dialyse much quicker than the other glycerides contained in butter. It is very likely we can separate them or their soaps by dialysis. It would be sufficient to test after the lapse of 24 hours.

2. *The application of Abbe's Refractometer*.—The characteristic glycerides of butter possessing a decidedly lower angle of refraction than the higher glycerides. The following proposal may be recommended:—Butter is melted at 40°C., and filtered. A few grams. of the clarified fat are now cooled, and kept for some time at 17.5°C., then pressed between dry filter-paper. The residue is weighed, and the paper extracted by ether, which is evaporated. A single drop of this oily residue now suffices to be tested in the refractometer, which will show at once whether the butter is adulterated.

This last proposal deserves great attention, and was particularly interesting to me, because I have been for six years accustomed to the use of the instrument, and was just about to publish a paper on the great difference between the angles of the various animal and vegetable fats. My method of working has been as follows:—The fat is melted and filtered, then kept for several days at 20°C. Most fats, if not actually keeping quite fluid, still remain very soft. The fat is now spread out on a watch-glass, and then covered with a Swedish filter, which soon absorbs the fat. The filter is lifted out, and a clear greasy spot forms in the centre, with which the cut edge of the Nichol has only to be touched to cause the material to adhere. The apparatus is now closed, and the angle estimated at 20°C.

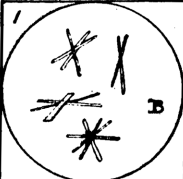
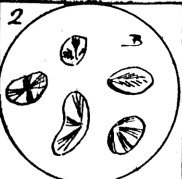
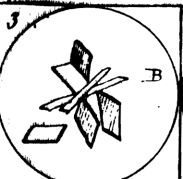
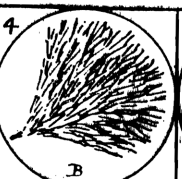
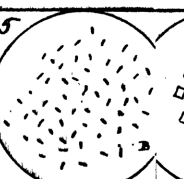
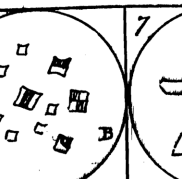
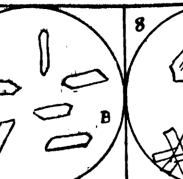
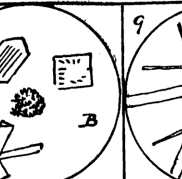
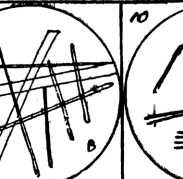

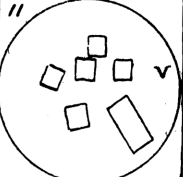
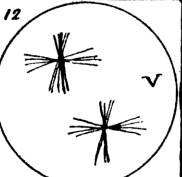
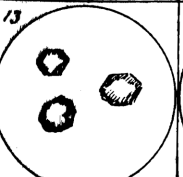
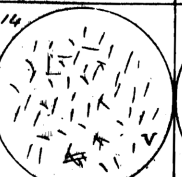
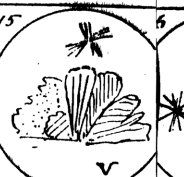
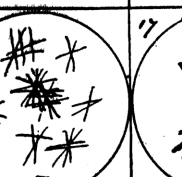
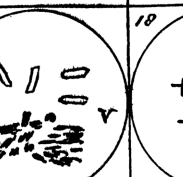
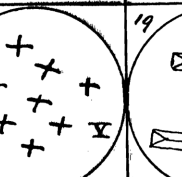
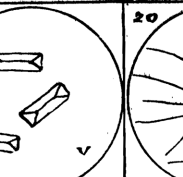
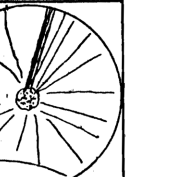
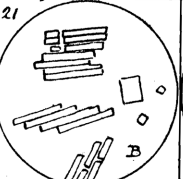
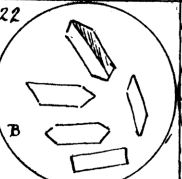
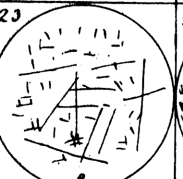
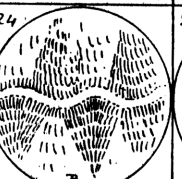

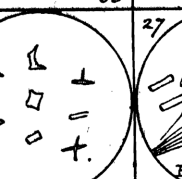
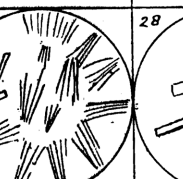
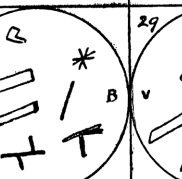
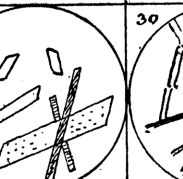
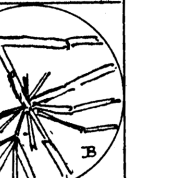
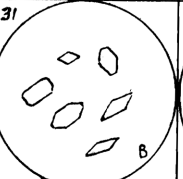
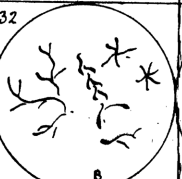
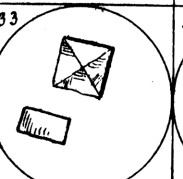
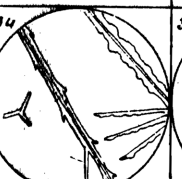
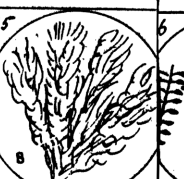
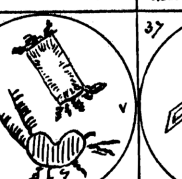
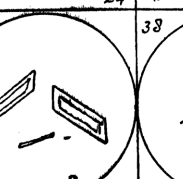
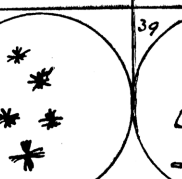
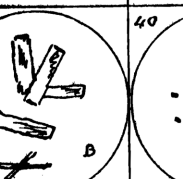
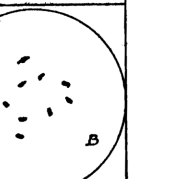
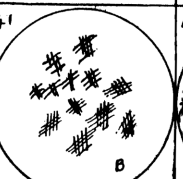

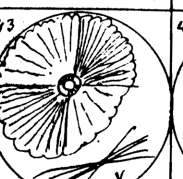
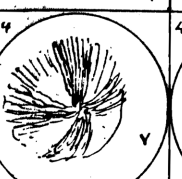
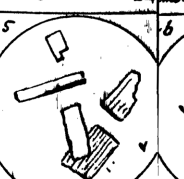
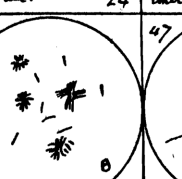
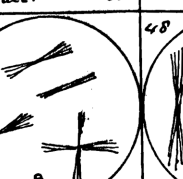
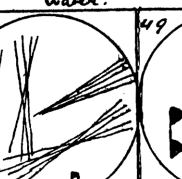
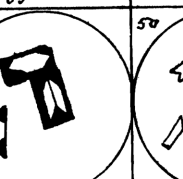
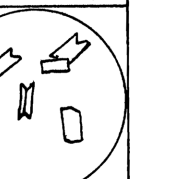
The following results were obtained:—(Water=1.333)

Butter olein	..	..	..	..	1.4635	
Olein from commercial oleic acid	..	..	..	..	1.4635	
Oleic acid at 17°C	..	..	..	..	1.4638	
„ at 20°C	..	..	..	..	1.4639	
Undoubted Gloucester butter	..	..	..	..	1.4652	
„	..	..	..	..	1.4658	
Cocoa butter	..	..	..	..	1.4680	
Lard	..	..	..	..	1.4690	
Margarine 1st quality	..	..	..	..	1.4692	
„ 2nd	..	..	..	..	1.4720	
„ 3rd	..	..	..	..	1.4796	
Margarine oil	..	..	..	..	1.4680	
Butterine	..	..	..	..	1.4712	} Hanoverian manufacture
„	..	..	..	..	1.4693	
„	..	..	..	..	1.4698	
„	..	..	..	..	1.4698	

* Rept. Anal. Chem.

MICRO-CRYSTALS.

By A. PERCY SMITH, F.I.C., F.C.S.

 <p>Quinidine alc + ether 55</p>	 <p>Cinchonidine alc. 55</p>	 <p>Quinidine Sulp. alc 55</p>	 <p>Cinchonidine Sulp alc. 24</p>	 <p>Morphine alc 55</p>	 <p>Meconic acid 55</p>	 <p>Narcotin alc 55</p>	 <p>Codeia ether 24</p>	 <p>Meconum water 65</p>	 <p>Papaverine alc 210</p>
 <p>Thebaine alc 210</p>	 <p>Narcein alc 55</p>	 <p>Aconitin hydrate water 55</p>	 <p>aloesine alc 210</p>	 <p>Amygdaline water 55</p>	 <p>Esculine 55</p>	 <p>Anemonine alc. 55</p>	 <p>Amygdaline alc 210</p>	 <p>Atropin alc 210</p>	 <p>Strychnin chlor. 55</p>
 <p>Cantharidin chlor. 55</p>	 <p>Bruceia Sulp water 55</p>	 <p>Caffeine chlor 55</p>	 <p>Chrysophanic acid fused 24</p>	 <p>Cinnamic acid Ether 55</p>	 <p>Colchicine water 210</p>	 <p>Coniine hydrobrom chlor 24</p>	 <p>Cubeline chlor 210</p>	 <p>Cytisin water 55</p>	 <p>Cytisin nitrate water 55</p>
 <p>Mellebrine hydrate 55</p>	 <p>Helonina alc 55</p>	 <p>Hyoscyamine hydrate water. 55</p>	 <p>Hemidesmus water 24</p>	 <p>Mammae water 24</p>	 <p>Picric acid alc. 24</p>	 <p>Piperins Ether alc. 55</p>	 <p>Picrotoxine water. 55</p>	 <p>Quassine ether 210</p>	 <p>Quassine ether 210</p>
 <p>Rutine water 210</p>	 <p>Santonin chlor 55</p>	 <p>Salicin alc 55</p>	 <p>Salicylic acid ether 210</p>	 <p>Solanin water 210</p>	 <p>Sesparins alc. 210</p>	 <p>Theobromine alc. 55</p>	 <p>Theine ether alc 55</p>	 <p>Calcic tartrate 55</p>	 <p>Pot hyd. East ppt 55</p>

Butterine	..	..	..	..	1·4733	English make
Refined Cotton seed oil			..	..	1·4748	
Crude	”	”	..	..	1·4732	
Cod liver oil	..	..	..	..	1·4801	
Linseed oil	..	..	..	..	1·4835	

The high angle of the cotton seed oil is very striking, and explains, perhaps, the high angles of the English made butterines, as much cotton seed oil is used in England. It is therefore easy to detect an admixture of butterine with large quantities of genuine butter, even if the former contains cotton seed oil. The admixture of lard is the most difficult to detect, but is still not by any means impossible. I therefore believe, that the Refractometer will play an important part in the future of butter testing.

L. DE K.
