ON THE PROPORTION OF FREE FATTY ACID IN CERTAIN OILS OF COMMERCE.

By L. ARCHBUTT, F.C.S.

1. *Olive Oil*.—During the past few years I have frequently examined samples taken from large bulks of olive oil intended for lubricating. The proportion of free fatty acid (calculated as oleic acid) in 89 samples which proved to be genuine, is given in the following table:—

Free Oleic Acid per cent.

Origin of oil.	No. of Samples.	Highest.	Lowest.	Average.
Malaga ..	12 ..	25·1	2·3	8·1
Seville ..	7 ..	10·0	2·5	5·3
Gallipoli ..	3 ..	15·0	8·2	12·2
Gioja ..	2 ..	10·4	10·0	10·2
Messina ..	5 ..	11·3	8·2	9·0
Unknown ..	60 ..	24·5	2·2	8·0

These results show that olive oil is liable to contain very considerable proportions of free fatty acid, which very much detracts from its value as a lubricant. I have also found it, on this account, very unsuitable for burning in lamps, the free acid (if exceeding about 3 to 5 per cent.) having a very serious charring action upon the wick.

2. *Rape or Colza Oil*.—This oil always contains a certain proportion of free fatty acid, but a far smaller and less variable proportion than olive oil. 44 samples of genuine refined rape oil for lubricating and burning, contained the following proportions of free acid, calculated as oleic:—

Highest ..	..	..	..	5·5 per cent.
Lowest ..	..	..	..	1·7 „
Average ..	..	..	..	3·0 „

3. *Palm Oil*.—This oil is liable to contain very large proportions of free fatty acid, as the following nine samples show:—

Brand.					Free Fatty Acid, calculated as Palmitic.	
1. Salt-pond	..	..	..	..	78·9	per cent.
2. Unknown	..	..	..	..	72·0	„
3. Brass	..	..	..	..	53·2	„
4. New Calabar	..	..	..	..	52·2	„
5. Unknown	..	..	..	..	35·3	„
6. Half Jack	..	..	..	..	24·4	„
7. Bonny	..	..	..	..	21·5	„
8. Unknown	..	..	..	..	13·3	„
9. Lagos	..	..	..	..	11·9	„

Free palmitic acid has a very corrosive action upon steel. A strip of bright steel immersed in palm oil containing free acid, will soon become discoloured, and will frequently be found to be deeply pitted in places, if left some time in the oil. The action is very irregular, and I have not always found the most acid oil give the worst results.