

EFFECTS OF OILS ON METALS.

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In the following I give the results of an investigation of the effects of different oils upon metals. The investigation was undertaken in consequence of some preceding papers, bearing upon the subject of the acidity of fatty oils in the columns of the *Oil and Paint Review*. There are, doubtless, several questions involved in this matter, besides the one which I now have endeavoured to answer, and in the course of my labors on this subject I shall try to approach such solutions as may ultimately give practical results. The object is, to prove by actual trials the relative value of different oils, not only as lubricators, but also as protectors of the different metals.

EFFECT ON BRASS.

Strips of sheet brass were covered, each separately with oil. The temperature was 81° F. The strips of metals were weighed; the temperature was kept uniformly at 81° F.; after sixteen (16) days the metal was removed from the oil and carefully washed with alcohol, dried and weighed.

1. *Menhaden Oil*.—Weight of metal: 0.590. The oil had become thick, gummy, and covered with a tough skin. After cleaning and drying the metal weighed 0.587; loss, 0.003. The metal itself was covered with a green film; the colour of the oil was unchanged.

2. *Crude Cottonseed Oil*.—Weight of metal when immersed: 0.574. The oil had retained its original consistency. The metal was covered with a green film; the color of the oil was unchanged. Weight of metal after washing and cleaning, 0.572; loss, 0.002.

3. *Lard Oil*.—Weight of metal when immersed, 0.572; the oil showed no change of consistency or color; there was only a slight tinge of green on the metal, which weighed after washing and cleaning, 0.5715; loss, not quite 0.001.

4. *Olive Oil*.—Weight of metal before immersion, 0.794. The oil was green from dissolved oleate; the metal was thickly covered with green film. Weight of metal after washing and cleaning, 0.790; loss, 0.004.

5. *Neatsfoot Oil*.—Weight of metal before immersion, 0.791; no change in color or consistency of oil, but a green residue or precipitate had collected on the bottom of the

glass ; the metal was covered with green oleate. Weight of metal after washing and cleaning, 0·787 ; loss, 0·004.

6. *Crude Petroleum from Scio*.—Weight of metal before immersion, 0·717. No change was observed in consistency or color of the oil, and there was no change in the appearance or color of the metal. Weight of metal after washing and cleaning, 0·717 ; loss, none.

The foregoing trials express in themselves the fact that the mineral oils form the best protectors for brass. The figures obtained by expressing the loss caused by the oils upon the metal, give also the relative value of the oils in this respect. Reduced, the following table is obtained, which may be considered as an indicator of the dissolving or corroding effect of these oils upon brass :

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|---------------------------------|------|
| Menhaden Oil | ·511 |
| Neatsfoot Oil | ·505 |
| Olive Oil | ·504 |
| Crude Cottonseed Oil | ·348 |
| Lard Oil | ·131 |
| Crude Petroleum from Scio | ·000 |

These figures may express the chemical effect of these oils upon brass, and thus give values for the estimation of these oils as protectors of metals : to form estimates of their values as lubricators, the above obtained factors will doubtless prove valuable, but the mechanical action in friction will have also to be considered.

These figures also express merely results obtained with the oils under investigation, as the acidity of the vegetable and animal oils differ. Probably the results of their effects upon metals will differ ; but in general it may be stated that these oils in course of time will invariably show acidity, and in this respect only mineral oils are excepted.—*Oil and Paint Review*.
