

with the testing of the oil for acid and the length of time it takes to run a certain distance on an uninclined sheet of iron before becoming "gummy," is, perhaps, one of the best for generally testing oil in respect to its lubricating power.

SPECIFIC GRAVITY.—Perhaps one of the best tests, if you first get a pure oil to start with (as a standard), is that of specific gravity. The co-efficient of expansion of the oil should also be taken into consideration, but the care and manipulation required is very great if accurate results are to be attained. I use a 50 gramme bottle, and find first what weight of distilled water it contains at 50°C . I next determine the weight of the same quantity of the oil and its temperature. Lastly, the weight of the oil is divided by the weight of the water. This gives the specific gravity. The co-efficient of expansion in this way has been found to be 0.00063 for every 1°C . Some time ago, in relation to this subject, a gentleman published in the *Chemical News* a list of 38 experiments made with different oils, and gave at the same time in a very able manner (for he was treating a difficult subject) the way his experiments were performed, but with respect to his results given about some of the oils, my experiments do not compare favourably. Whether he or I had the pure oil to work upon is to be proved. I just say this to show the difficulty of procuring pure oils for first experiments, for I have no doubt our experiments were both accurately performed.

And now to examine a few of the oils individually.

PETROLEUM.—A good test for petroleum oil is to mix sulphuric acid with its own bulk of water and add the oil to be tested. The water and acid ought to become a little yellow, and, of course, the oil whiter, when mixed together. It should have a specific gravity of between 0.797 and 0.805, and be perfectly sweet in smell. I am sorry to say that the Americans are loading the burning oils they are sending into this country with as much naphtha as they possibly dare. This is a state of things that ought not to be allowed, and it is quite time the Government looked more fully into the indiscriminate sale of these highly dangerous burning oils, for I firmly believe from experiments made by myself that if the oils spoken of were thoroughly tested, and results of quantities put together, it would be found that more than two-thirds of the oil sold would give off inflammable vapours at under 105°Fahr . The subject of the testing of petroleum oils is one that would repay any chemist to give much time and attention to.

BOILED LINSEED OIL.—I should have wished to have said much upon the subject of boiled linseed oil, for I have given it a little of my attention, but time has prevented me from doing so. I have found that the oil must be perfectly clean and bright before being boiled, and the heat raised to about 325° . The older the oil is in its raw state the better, and the chief cause why we have so many complaints on every hand about boiled linseed oil is because every