

quarter of section 21—something over 200 acres. Probably more than one-half the area of the lake is less than 12 feet deep. Much of the bed of the lake is hard sand and gravel, much is fine black mud and some is white mud. The mud is sometimes from four to six feet deep and very thin. Much of the bed is covered with chara, sometimes of stunted growth, but often the growth is luxuriant, stems two and three feet long being common. The bar in the center of the west half of section 22 is covered with from 10 to 12 feet of water and the surface of the bar is covered with a mat of chara from 12 to 18 inches thick, that was so firm as to make the work of sounding difficult. There are several different species of potamogeton growing in the lake. They grow in water of different depths, so that my oarsman could tell about the depth from the kind of weed. Large areas are covered with different species of bullrushes: pickerel weed is abundant and so is *Vallisneria spiralis* and *Peltandra undulata*. I was able to make a list of 163 plants and trees found in and around the lake.

PHOTOMETRIC MEASUREMENTS OF DIFFERENT SAMPLES OF OIL.

BY CHARLES T. KNIPP.

It was a question in my mind for some time whether the difference in the different grades of oil warrants the difference in the price—whether White Seal oil is worth five cents more per gallon than Eosene oil, and if so, what particular quality gives it its value.

The test was a simple one, yet it required care and time in taking the observations to insure accurate results. Five samples of oil were furnished by the local dealers. The oil was taken from large storing tanks and can be considered quite pure. Each sample was tested for its quality and quantity of light, its specific gravity and its "flashing point."

The photometric test was made on a Bunsen photometer bar adjusted to 100 inches between centers. The oil was burned in a student's lamp and balanced against an incandescent lamp burning at 110 volts. The voltage was controlled by a rheostat. A new wick was used for each sample and the lamp was allowed to burn for a few hours before the measurements began. In order to keep the lamp burning at a constant candle power, readings were taken on the bar at intervals of fifteen minutes. The test for each sample extended over from five to seven hours.

The C. P. of the standard at 110 V. was taken as 16.

The specific gravity was determined by a hydrometer and also by weighing on a delicate balance.

In determining the flashing point the open-vessel method was used. The oil was put into a porcelain evaporating dish and slowly heated. It was constantly stirred with a thermometer. A small jet burning at the end of a glass tube was held a half inch above the surface, and the flashing point noted. Each sample was tested in this way four or five times.

The table on the opposite page shows the results of the observation.

The flashing point of safe oil should not be less than about 115° F. or 46° C., having a gravity of from 40° B. to 50° B. The above oils, in my test, all come within the safety limit except the last sample, whose flashing point tested 44:37 C. Of the above the White Seal and the Eosene are held as the best grades, the others are cheaper grades. The White Seal retails for 20 cents, the Eosene for 15 cents and the Headlight for 10 cents. Noting the flashing points of the three samples it would appear that the cheapest oil is the safest. The samples tested are all safe with the exception of the last sample, and as far as quantity and quality of light are concerned there is but little difference.

PHOTOMETRIC MEASUREMENTS OF DIFFERENT SAMPLES OF OIL.

COMPARATIVE TABLE.

Sample of the Oil.	C. P. of Standard V. at 110.	C. P. of Oil.	Oil Consumed per Minute.	Oil Consumed per Hour.	Gms. per L. C. P. per Hour.	One gal. at 10 C. P. No. of Hours.	Sp. gr. at 20 C.	Flashing Point.	Flashing Point, When Cooled, from	Allowed to Cool to 20 C. and Again Heated, Flashed at
Eosene	16	10.47	.75	45.42	4.34	68.47	.7847 50° B	49.3	77.5° -51° 100.5 -53 187 -58.5 151 -63 181 -73	74
Perfection	16	10.5	.73	43.92	4.18	72.24	.7977 47° B	49.3	77° -54° 124 -63 155 -75 172 -86	83
Headlight	16	10.57	.75	45.38	4.29	71.25	.8075 45° B	53.25	75° -54.5° 127 -74 151 -90 180 -101	98
White Seal ...	16	10.9	.76	45.97	4.22	70.42	.7845 50° B	47.6	76° -56° 129 -67 152 -79 175 -93	87
Lighthouse ...	16	11.05	.73	44.05	3.98	75.77	.798 47° B	44.37	77.2° -53.3 124.7 -64.7 150.2 -75 174.6 -84.6	82