No. 570 is Cotton Seed Stearine, one year old.
" 571 is Summer Yellow C. S. oil, one year old.
" 572 is Winter Yellow C. S. oil, one year old.
" 573 is C. S. oil from Columbia, S. C.
" 574 is C. S. oil from New Orleans.

	Sample number,			
	575	1529	1530	1626
Liquid acids	64.15	83.97	86.96	79.84
" " iodine number	99.48	144.40	139.40	114.00
Hubl's number	64.96	121.70	122.70	93.53
Saponification equivalent	287.85	......	......	......
Titer of fatty acids	37.4	......	......	......

No. 575 is an average sample of Steam Lard.
" 1529 is Corn Oil.
" 1530 is " "
" 1626 is Peanut Oil; the solid fatty acids showed Arachidic acid in large quantity.

The iodine number of the liquid lard acids is unusually high; Muter gives ninety-two to ninety-four, but this seems rather too low, the average being about ninety-six. I hope, at some future period to make a more complete investigation of this method, and present the results to the Society.

LABORATORY NOTES.

BY FRANK JULIAN.

Received June 22, 1893.

DETERMINATION OF CARBON IN STEEL.

AFTER dissolving a sample of wrought steel in copper-ammonium-chloride or copper-potassium-chloride, the carbon remains in the form of a soft mass, which is tedious to filter and troublesome to wash completely. These difficulties may be overcome by the use of the following device: A piece of stiff platinum gauze about fifty mm. in diameter is bent into the form of a shallow dish, and to the edge is soldered a thick platinum wire which hooks over the edge of the beaker, suspending the gauze about forty mm. below. The saturated copper solution is poured on the drillings in the gauze (to remove air-bubbles) until it is covered, and the beaker allowed to stand until complete solution has occurred. This will require from one to four hours, depending on the fineness of the drillings; if convenient, it may stand over night.

The carbon, nearly all of which in the case of the harder varieties of steels, remains in the gauze, is washed back into the beaker, and after settling a short time, is filtered in the usual manner.

Although a larger quantity of the copper solution must be used, and a longer time is required for dissolving in this way, yet the ease of filtration and washing is a sufficient compensation; especially in the analysis of steels of over 0.20 per cent. of carbon, when the residue retains the form of the original drillings, and may be washed entirely by decantation.

In the softer steels where the drillings are in the form of lumps, a little gas is evolved during solution, which, however, is nearly odorless.

COMBUSTION OF CARBON IN AIR.

The carbon separated from steels, I find may be burned completely in a current of air, dispensing with the use of oxygen which is frequently difficult to purchase of the desired purity. The combustion should proceed rather slowly; the roll of copper oxide in front of the boat being kept at a dull red heat throughout.

PRECIPITATED BINOXIDE OF MANGANESE.

When manganous nitrate in solution in strong nitric acid is heated with potassium chlorate, a precipitate of manganese binoxide forms, in which the manganese may be estimated gravimetrically, or calculated from the weight of the extra atom of oxygen found volumetrically. Many chemists aver that the latter proceeding always yields lower results than the former, presumably because an oxide lower than the binoxide is co-precipitated, *e.g.*, 10 $MnO_2 + MnO$ (Stone, *Trans. A. I. M. E.*, **11**, 327 and **12**, 517); while others deny this, claiming, with good reason, that in such a strongly oxidizing solution, no such lower oxide could be formed (Mackintosh, *loc. cit.*, **12**, 79 and Troilius, **12**, 75).

An observation of a large number of determinations made on the same samples by both methods seems to prove that a greater or less discrepancy is always to be found; for example, on a ferromanganese of eighty per cent., a difference of upwards of one per cent. is frequently obtained; while in steel the results are practically identical.

It has occurred to me that the explanation of this fact was simply that more or less (according to the conditions of dilution, etc.) manganous nitrate was carried down mechanically enclosed in the precipitating binoxide, and from which, as in the analogous case of barium chloride occluded in barium sulphate, it cannot be removed by washing with nitric acid or water. It is found that when the solution of manganese contains ferric nitrate, a small quantity of iron is precipitated with the binoxide; this may be ferric nitrate enclosed in the same manner, and where the amount of manganese or of iron in solution is relatively large, one would expect to find a greater quantity in the precipitate.

USE OF HYDROGEN PEROXIDE.

In the analysis of steel or iron, a dilute solution of this reagent may be used with advantage to dissolve the manganese binoxide precipitated by potassium chlorate, the excess being found by titration with 1-20 normal permanganate. For this purpose it has been employed for some years in this laboratory with good results, being used without filtration of the nitric acid from the manganese binoxide, as it is unaffected by dilute nitric acid and the slight excess of chlorine present. One molecule of manganese binoxide is reduced by one molecule of hydrogen peroxide; and one molecule of permanganate of potassium by five molecules of the peroxide.

PHOSPHORUS IN PHOSPHOR-BRONZE.

When some samples of phosphor-bronze are dissolved in diluted nitric acid, the phosphorus is acted on in a similar manner to that in iron and steel, a portion of it passing into a combination with oxygen which does not combine with metastannic acid, nor is precipitated by molybdic acid. It is advisable, therefore, to complete the oxidation by evaporating the filtrate from the metastannic acid with chlorate of potassium, or otherwise, and then to test with molybdic solution. Occasionally samples of phosphor-bronze yield as much as seven per cent. of the total phosphorus in the solution ; others show only traces.

LABORATORY ILLINOIS STEEL CO.,
SOUTH CHICAGO.

PATENTS OF INTEREST TO CHEMISTS.

EDITED BY A. H. WELLES.

Nitric Acid.—Oscar Guttmann makes nitric acid by forming gaseous nitric acid in a distilling chamber, conducting it in a tube to a condenser and introducing an air-blast into the tube to act upon the gaseous nitric acid before condensation (491,481).

Starch.—Julius Dubiel has a process for the manufacture of starch (493,689).

Fertilizers.—To make fertilizer from tank water, O. T. Joslin (489,010) evaporates the water to a thick syrup, adds a small per cent. of sulphuric acid and from five to twenty per cent. of magnesium sulphate, absorbs the supernatant liquid with some suitable substance and dries the mass at 300°-400° F. and grinds.

Cattle Food.—Arno Behr treats Indian corn in aqueous solution with sulphurous acid, separates the starch as usual, adds sulphuric acid to the steeping water, evaporates, and adds an absorbent to form a rich cattle food (491,234).

Sugar.—489,879 is granted Carl Steffen for a process for obtaining sugar.

Milk and Butter.—A milk coagulating product is patented by Clarence P. Eyre, but the description is exceedingly vague as to the nature of the ferment used (491,416). Pepsin, gum arabic, and alum are claimed by S. C. Wilson (489,775) as a compound for increasing the yield of butter from milk, and David W. Hudson *et al.* proposes (489,814) to manufacture a so-called butter containing pure butter, sweet milk, and oil of cocoanut.

Brewing.—A. Hummel has a new process for the manufacture of beer (492,292), C. Heintz, a method and apparatus for purifying and softening liquors (492,542), and R. Rahr a process for making caramel malt (491,813). Moses Wool is granted 493,460 for a process for making brandy-mash and composition for same, and electricity is used by John Becker for purifying and ageing liquors (493,809). 490,538 is a process for preparing raw grain proposed by H. T. Brown. 490,056, Otto Zwietusch, patentee, is a process for making beer, and Arnold Kreusler (489,018) also has a new method of obtaining the same beverage, and E. A. Spink ages liquors in an original way (489,337).

Filtering Apparatus.—Simeon L. West has an apparatus for purifying, sterilizing, and filtering drinking water or other potable liquids (491,828).

Disinfectant.—Should the cholera come this year, as is feared, Albert