whether differences found were attributable largely to differences in behavior of the cells, identical solutions were electrolyzed with graphite electrodes at 7 volts and 50° C. with the results given in Table VI.

Obviously, the differences in composition of products from the various cells were small; in fact, the agreement was better than sometimes obtained in successive electrolyses of similar solutions in the same cell. Differences in yield were large, but yields were of secondary importance to composition of the products at the time this work was done. It is known that better yields are obtainable in a cell of better design.

Efforts to determine more than one decomposition potential were unsuccessful. When the applied potential was gradually increased from zero and the current noted 30 seconds after each successive increase in potential, there was a sharp increase in current with a small increase in potential at a little above 2 volts. If the solutions contained ethyl alcohol, the current-potential curve was practically a straight line above this decomposition potential, the slope of the curve being greater the higher the temperature. In absence of low molecular alcohol, the current continued to rise only until a potential of 3 or 3.5 volts was reached and then decreased slightly while the potential increased to high values, perhaps due to collection of fatty acids on the anodes. Analysis of products from electrolyses at various potentials gave no indication that decomposition potentials could be obtained by this method or that composition could be varied appreciably by choice of potentials.

When a diaphragm was used to separate anode and cathode compartments, no organic products of electrolyses were found in the cathode compartment and the products from the anode compartment were practically the same as those obtained from cells without diaphragms. The material used as cathode had no effect on the composition of the products. The following factors had only minor effect on the composition of the products compared to the effect of the material used as anode: current density, concentration of soap, concentration and kind of inorganic salt, mixtures of salts or salts and alkali, ratio of soap to salt, periodic addition of fatty acids, soap, mineral acid or other material, maintaining a constant pH at various values between 6.5 and 11.0, design of cell, etc. Soaps other than coconut oil soap, such as those from pure lauric acid, pure myristic acid, commercial stearic acid, commercial red oil, etc., also yielded products calculated to contain 70 to 80 per cent alcohols + olefines of one less carbon atom than the original soap. (Unsaponifiable material was extracted from the red oil soap before the electrolyses.)

The fact that soaps from individual fatty acids gave about the same results as the soaps from commercial oils indicates that the assumption made in the calculations is not greatly in error.

## Summary

It is not thought that the electrolytic reactions are simple, nor is it thought that the types of compounds discussed are the only ones in the products of electrolysis. Although the calculated compositions are not precise, they are of the right order of magnitude, and good yields of products consisting mainly of alcohols and olefines are obtained by electrolyzing with graphite anodes a soap solution, preferably containing appreciable amounts of an inorganic salt and a low molecular alcohol.

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# Report of the Glycerin Analysis Committee

FOR some time the Glycerin Analysis Committee has been inactive. It is now proposed to reopen the subject with a survey of existing methods of glycerin analysis, comprehensive enough to include:

1. Determination of the glycerin yield of fatty oils.
2. Analysis of lyes, sweet waters, etc.
3. Analysis of crudes and intermediates.
4. Analysis of finished glycerins, including detection and estimation of impurities.

Such a program obviously will require several years for its completion. Fortunately we have as a basis the excellent work of the International Committee whose methods have stood the test of daily use for nearly a quarter century. Most of these methods can be adopted with little or no change whatever.

During the coming year it is proposed to confine our work to a study of the dichromate process and the determination of the glycerin yield of fatty oils. Suggestions and assistance from anyone interested will be very welcome.

RALPH B. BAILEY
H. C. BENNETT
W. H. BURKHART
J. E. DOHERTY
CHAS. G. GUNDEL
L. F. HOYT
W. J. REESE
M. L. SHEELY
J. T. R. ANDREWS, Chairman