CORRELATIONS AND DISCUSSION

Figure I shows the relation of Contraction to Hydrogen Conversion and it will be noted that the present data are in excellent agreement with the previous correlation.

Figure II is a similar correlation of Hydrogen Conversion to CO Conversion. In this plot the data are somewhat more widely scattered due to the enlargement of the CO Conversion scale.

Figure III shows the relation of Hydrogen Conversion to the yield of CO2 expressed as a percentage of the CO fed to the reactor. In this plot it will be noted that the yield of CO is lower than called for by the correlation either at 1.5 or 2.0 H2/CO ratio. Since the Montebello H2/CO ratio is between 1.6 and 1.7, it is apparent that less CO2 is being produced at Montebello than at Beacon or Clean. This is believed to result from the higher CO2 content of the Montebello generator product which contains about 2% CO2.

Figure IV shows the yields of Methane, C2's and C3's expressed as percentages of the CO fed to the reactor. The scatter of the Methane points is so great that no curve has been drawn. This scatter is believed to result from the uncertainty of the explosion analyses on the generator product. There is no observable trend in the C2 or C3 yields with conversion.

Figure V shows the unsaturation of the C2, C3 and C4 fractions as a function of Hydrogen Conversion. There appears to be some decline in the unsaturation of the C2 fraction and some rise in the unsaturation of the C4 fraction and no change in the unsaturation of the C3 fraction.

Figure VI shows the relation of C3 and Heavier yield to Hydrogen Conversion for the Montebello data. The curve drawn lies directly on the Beacon curve for 2.0 H2/CO ratio. Since the Montebello generator gas is in the range of 1.6 to 1.7 and since the C3 and Heavier yield increases with H2/CO ratio, the Montebello yields are higher than the corresponding yields at Beacon. This is of course a reflection of the lower CO2 yields experienced at Montebello and is in turn a reflection of the higher CO2 content of the Montebello generator gas.

Figure VII is a plot of the ultimate oil yields as a function of Hydrogen conversion. These ultimate oil yields are calculated on the basis of 90% C3 olefin polymerization and 95% C4 olefin polymerization. A scale has, also, been shown for the corresponding yields to be expected from Brownsville gas which has an average carbon content of 1.074 atoms per mol against the 1.189 atoms per mol for the Montebello gas. Since

this function does not depend on the explosion analyses, it is believed to be somewhat more general than the others shown.

It should be borne in mind that the correlations presented are based on preliminary data from runs which have been shorter thandesired and which have, in many cases, given poor weight balances. The agreement with the correlations of earlier data from Olean and Beacon is thought to be quite good, however, and this together with the internal consistency of the data, indicates that the data,can be relied upon to a greater extent than would otherwise be the case.

In studying the data no general relationship has been found relating the CO Conversion, H2 Conversion or Contraction to operating conditions. As pointed out in an earlier report, the degree of initial catalyst reduction appears to be the principal factor in the observed variations in these relations. In the study so far made, the effects of temperature, bed density, feed rate, and catalyst inventory have not been apparent.

FIGURE I

MONTEBELLO SYNTHESIS UNIT

Comparison of Montebello Data
With Gaucher Correlation

Contraction Vs. H2 Conversion

H2/CO Ratio for Montebello 1.6 - 1.7

Gaucher Correlation
H2/CO = 2.0

Correlation
H2/CO = 1.5

Contraction %

Hydrogen Conversion %

85
80
75
70
65
60
55
50
45
40
50
60
70
80
90

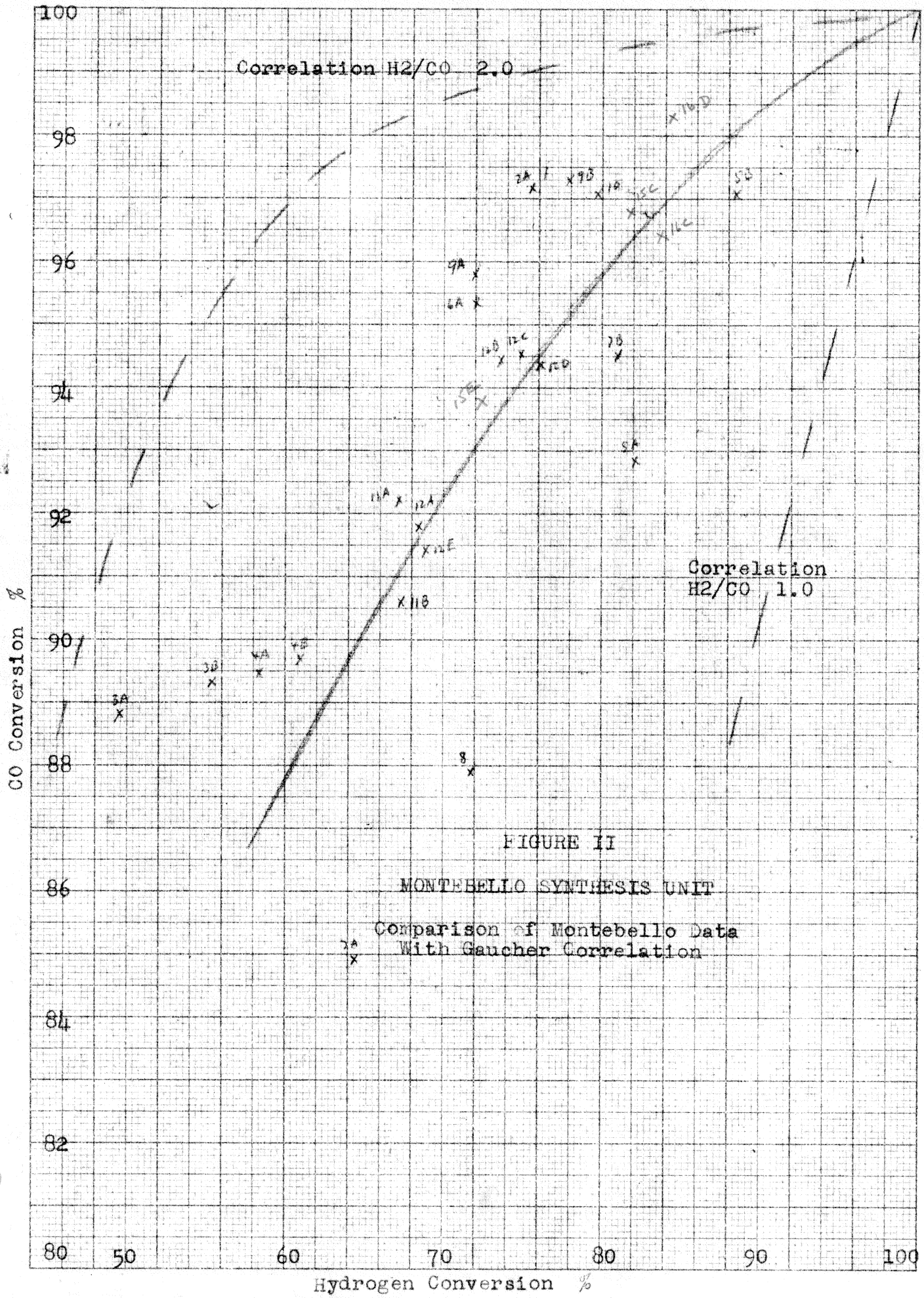

FIGURE II

MONTEBELLO SYNTHESIS UNIT

Comparison of Montebello Data With Gaucher Correlation