efficient further conversions. An additional specification is that chain lengths C_{15} and C_{16} are amenable mainly to desaturation but much less to elongation, while chain lengths C_{17} and C_{18} are amenable to both processes.

In the above terms, the conversion of $\Delta^{4,7,10,13}-C_{16}$ acid by the rat (31) can be explained by elongation into a C_{18} acid which has a double bond system implying the favorable position 9. When the same elongation occurs with the other C_{16} acids, their double bond system involves position 11, i.e., the first prerequisite for efficient subsequent conversions is not fulfilled. The non-conversion of $\Delta^{10,13}-C_{19}$ acid is explained similarly by the unfavorable distance between double bond and the carboxyl group.

The conventional classification of fatty acid families is based on the distance between double bond system and terminal methyl group. It had been deduced from the overwhelming majority of polyunsaturated fatty acids which occur in fish or liver and brain of other higher animals (32). The classification was found to reflect interconversions of the most common even-numbered acids with 18 or more carbon atoms, and it has the advantage to afford predictions about their physiological importance for higher animals.

The classification deduced from odd- and even-numbered acids of mullet takes reference to the carboxyl group. It specifies the 9–10 position as crucial for interconversions which may involve plant or vertebrate type desaturation, and it distinguishes the chain lengths of 9-monoenes in regard to their ability to elongate in the course of further desaturation. The fatty acids of mullet fit well into such scheme and certain other data on interconversions can be explained. It is uncertain to what extent such classification will lead to positive predictions about the physiological importance of unsaturated fatty acids for higher animals. So far, there are only negative results which can be explained by reference to the carboxyl group but not by reference to the terminal group (26). The different concept might contribute to better understanding of the earlier definition of structures prerequisite for essentiality.

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• *Letters to the Editor*

Re: The Pancreatic Hydrolysis of Natural Fats. III

I HAVE RECENTLY reported (1) that during the hydrolysis of lard with pancreatic lipase, the residual triglycerides, and the diglycerides formed, become progressively more saturated as hydrolysis proceeds; the monoglyceride composition remains virtually constant throughout. I have suggested that these observations may be explained on the assumption that the fatty acid distribution in lard follows that suggested by R. J. VanderWal (2).

However, though these observations are consistent with the occurrence of the VanderWal distribution in lard, they are not demonstrative of it, since other distributions can give rise to the same results. The VanderWal distribution implies:

a) The fatty acids of the 2-positions are randomly distributed with respect to those of the 1- and 3-positions.
b) The acids of the 1-positions are randomly distributed with respect to those of the 3-positions.
c) The fatty acid composition of the acids of the 1-positions is the same as that of the acids of the 3-positions.

Now to obtain the results described above, it is only necessary for condition (a) to be fulfilled. It does not matter how the acids of the 1- and 3-positions are distributed, if thereafter those of the 2-positions are distributed randomly: the same experimental results will be obtained in all such cases.

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Relation Between Iodine Value and Linoleic Acid Percentage in Cottonseed Oil

STANSBURY AND HOFFPAUIR [JAOCS *29*, 53 (1952)] demonstrated that the regularity in the increase in linoleic and in the decrease in oleic and saturated acids with increase in iodine value (I.V.) can be summarized by the regression equation of each acid on the I.V. This equation was established on 48 samples of oil ranging from 89.8–117.0 in I.V.

In our own experiments, we were struck by the invariability of the I.V. of the seedoils of cottonplants grown in the same glasshouse on different culture mediums. It appeared that we might try to see if a relation exists between I.V. and linoleic acid of cottonseed oils obtained during different years.

The experimental data were taken from three trials. The I.V. of individual samples ranged from 110.0–120.2. We were able to calculate the regression equation shown in Figure 1. It is statistically highly significant (99%).

Thus we were able to confirm Stansbury and Hoffpauir's statement: the increase in linoleic acid and the increase in I.V. are positively correlated.

This conclusion, which is very important from a practical point of view, holds as well for seed oils from various regions as for seed oils from different years.

Our results are in agreement with Howell and Collins [Agron. J. *49*, 593 (1957)]: the linoleic acid percentage and the linolenic acid percentage may be controlled by the temp maxima in soybean oil. Indeed, in our own experimental conditions, only the temp (average and maxima) might have changed from one year to another.

On the other hand, there is no correlation between the I.V. and the linoleic acid percentage in any individual trial: the values are randomly dispersed.

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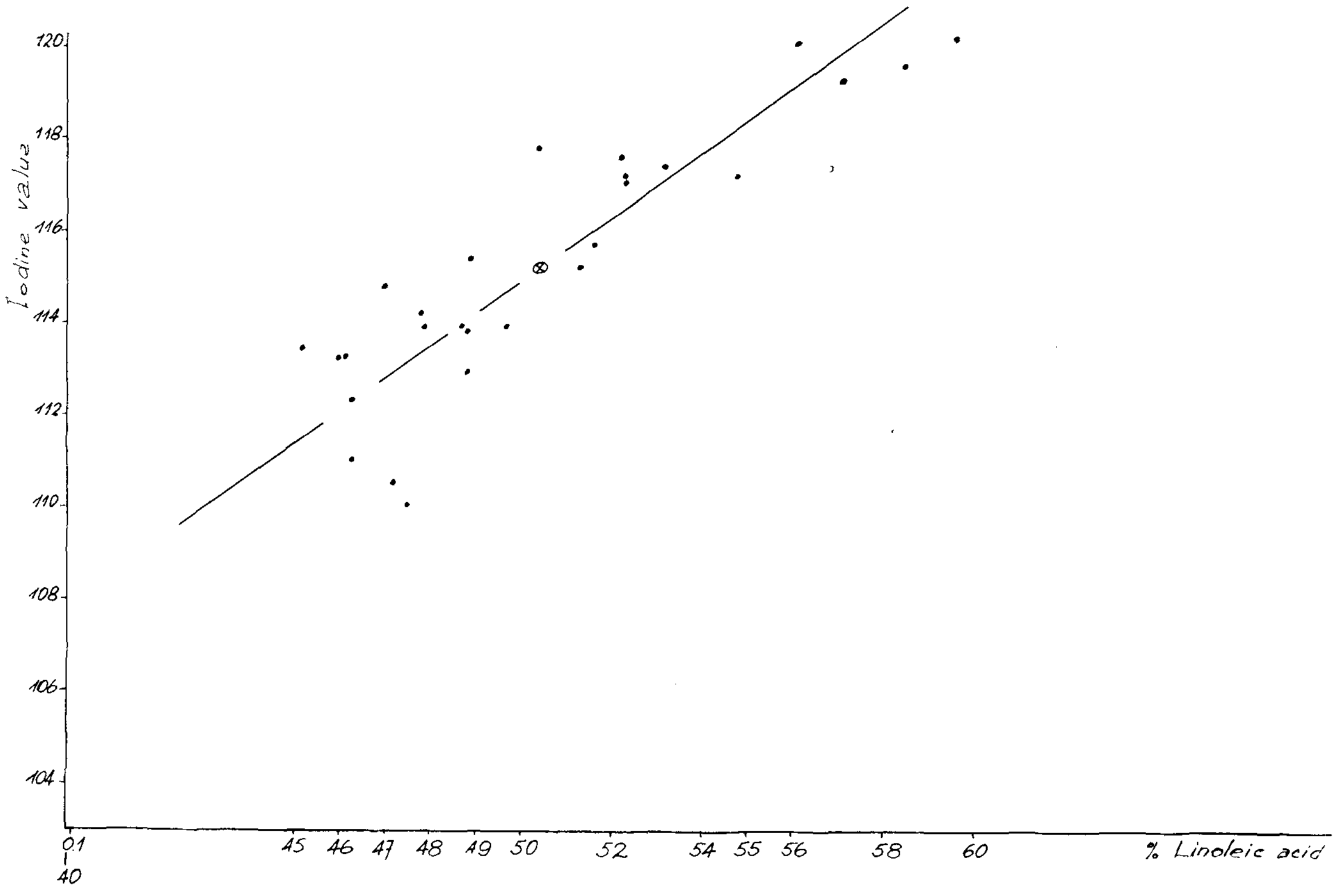

FIG. 1. Relation between iodine value and linoleic acid percentage.
$y = 0.70x + 79.92$