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COMMUNICATION ON
THE DEVELOPMENT OF N-PARAFFIN YEAST^{1/}

by

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We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.

I am not allowed to give you many details about the process we are working on because Institut Français du Pétrole is now engaged in a joint venture with the French oil companies with a secrecy agreement. But I would like to take this opportunity to tell you some very important points which have not been sufficiently developed by other speakers.

First, very briefly we are working on pure n-paraffins feedstock with less than 1 part per billion of carcinogenic compounds like benzopyrene, methyl cholanthrene and dibenzanthracene.

Our yeast is cultivated at 40° and at this temperature the yield is more than one hundred per cent. The protein content at this temperature is about 60 per cent. The cystine and methionine content are classical for yeast, 7,5% for cystine and 1,7% for methionine. About fermentors during the past ten years we have tried to improve gas lift fermentors and their productivity is now above 2,5 kilogram per cubic meter of liquid per hour with an energy usage of about 1 kwh per kilogram of yeast.

But all this is classical now and I would like to emphasize some points. The first one is that in our opinion it is not realistic to run continuously in big fermentors of about one thousand cubic meters in complete sterility.

Regarding this point it is very important to get a yeast sufficiently strong to compete with other microorganisms.

It is the reason why improvement by genetical studies of amino acid pattern is not realistic in continuous culture.

I would like to emphasize another common problem in continuous culture. It is foaming and I think that this point has to be considered very carefully as well as yield or productivity. I am surprised by the fact that no fundamental research has been done in this field because foaming is in many cases a characteristic of yeast in special conditions of culture.

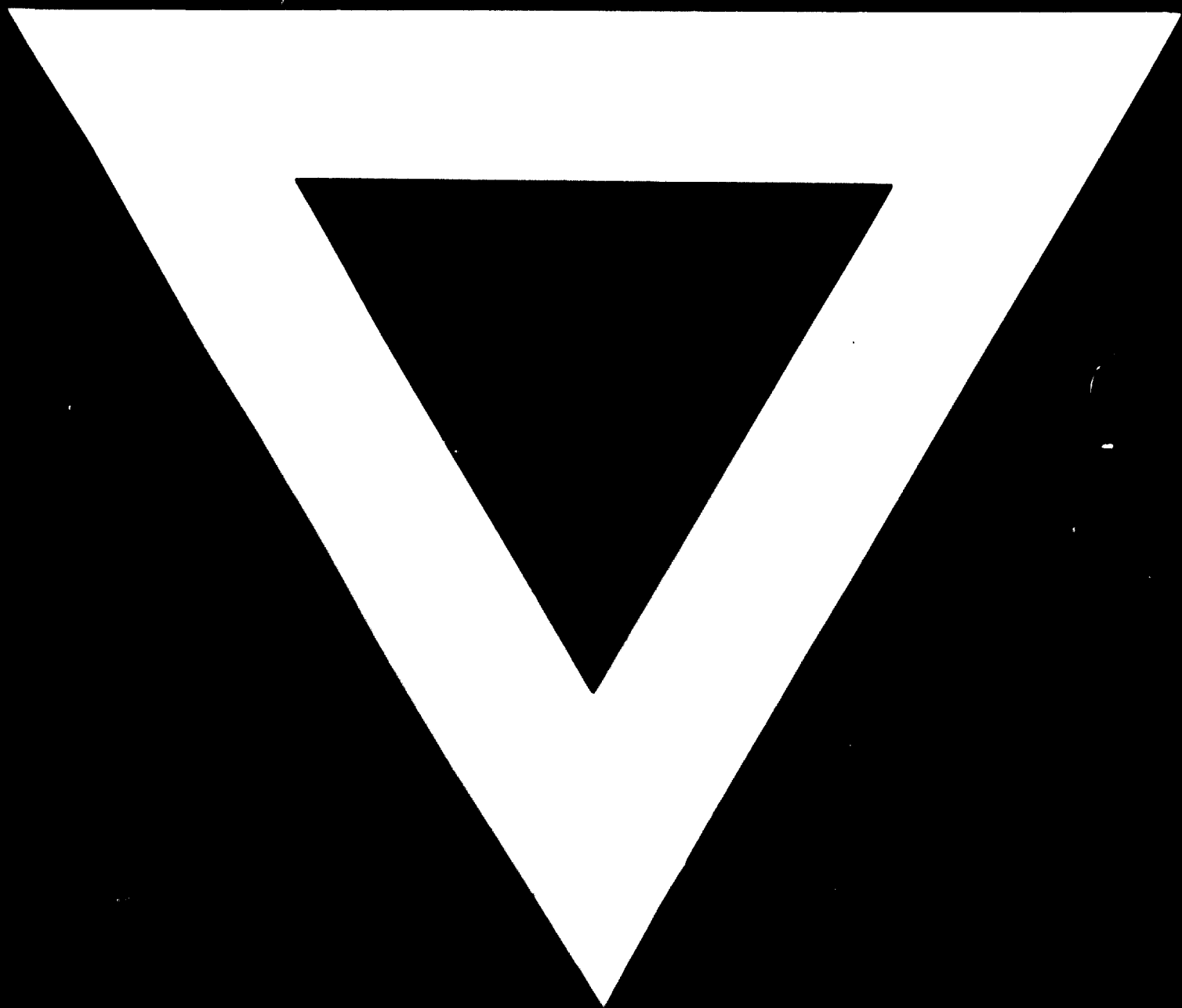
Another point is cooling of fermentors. If you get a thermophilic strain it is possible to put the heat exchanger inside the fermentors to avoid the pumping of broth. I think that now it is possible at 40°, if you have high yield thus decreasing the amount of heat to be removed.

Concerning toxicological testing, I would like to say that in spite of extensive research it has not been possible to find a strain of yeast, running continuously on pure paraffins, which can synthesize some toxic substance for animals and if this point is confirmed by other laboratories in the world it is very important for the future of industrial production of SCP on this feedstock in non-sterile condition.

About long-term toxicity and nutritional studies all the tests with our strain are under investigation with the help of the National Institute for Animal Production in France and under the control of the appropriate French committees according to the guidelines of PAG.

In concluding I would like to say that if a good question concerning the state of research and development in this field is "how big is your plant?", another question is, in my opinion, as important. It is, "how long has it been running continuously at the process capacity without any problem?"





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