

Docteur Florent Coste  
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Médecin des Hopitaux de Paris

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41, rue Cardinet

Paris, December 24th, 1936

Dr. R.A. Kehoe  
University of Cincinnati  
College of Medicine  
Cincinnati, Ohio, U.S.A.

Dear Dr. Kehoe,

I was very glad to receive your letter, for I was just going to write you to ask you a certain number of questions regarding the subjects to which you refer. I would make the following comments on some of the points on which you want information :

I. Eventual necessity of adjoining me another doctor.

I think that this is useless for the time being, though I have been much more busy since a few years and especially I have been appointed Professeur Agrégé at the Faculté de Médecine last year, it is quite possible for me to fulfill my work for Ethyl Export Corporation just now and I hope this will continue. If in the future I realize that I am not in a position to carry on all necessary examinations, I will advise you immediately. As long as I can do it myself and alone, I prefer it. As a matter of fact, an assistant would be especially useful to me for the distant plants, and I should therefore choose him among the local doctors, whom I know far less well than those in the Paris region. I would therefore always be somewhat anxious as to the real competence, the capacity and the tact of the doctor selected. In consequence, I would ask you to drop for the moment the question of a medical assistant.

II. Importance of Ethyl mixing plants now working in France.

The number of Ethyl plants has increased to a relatively great extent. Here is a short list which will enable you to realize the present situation.

1) Paris district.-

Desmarais Frères, Ivry :- Rather important volume of business, 6 blends of 200/400 cubic metres of gasoline a month.

Standard Française des Pétroles, Saint-Ouen :- Rather frequent blends, but of little importance (45 cubic metres of gasoline) The Direction have promised to bring the number of mixes to normal.

French Government, La Courmauve :- Not very frequent blends. One blend per month, but rather important (1200 cubic metres of gasoline).

Jupiter, Pantin :- Rather few blends, 4 to 5 a month, and of very little importance (40 cubic metres).

Consommateurs de Pétrole, La Plaine St. Denis :- 4 blends per month, of little importance (50 cubic metres).

Lille-Bonnières & Colombes, Colombes :- Infrequent blends (one per month).

## 2) Western district.-

Consommateurs de Pétrole, Donges :- Rather numerous blends (up to 10 per month), but of small volume (55 cubic metres).

Standard Franco-Américaine de Raffinage, Port-Jérôme :- About 8 blends per month (800 cubic metres).

Raffineries de la Vacuum Oil Co., Port-Jérôme :- Infrequent blends (about one per month, of 500 cubic metres).

## 3) Eastern district.-

Pétrolest, Strasbourg :- Blends not very important (40 cubic metres) but rather numerous (4 to 9 per month).

French Government, Metz :- Less than 2 blends per month (200 to 400 cm.)

French Government, La Forge :- Less than 1 blend per month (160 cubic metres)

Propétrol, Strasbourg :- No blends have been carried out up to now; I hear that they have received no Fluid yet.

## 4) North district:-

Société Générale des Huiles de Pétrole, Courchelettes :- Very infrequent blends, less than one per month, and of small volume.

Raffinerie de Pétrole du Nord, Dunkerque :- No blends carried out yet.

Consommateurs de Pétrole, Dunkerque :- 5 blends per month (55 cubic metres).

## 5) Central district.-

Société Française des Carburants, Gimouille :- Very infrequent mixes. One blend in 6 months (325 cubic metres).

Consommateurs de Pétrole, St. Priest :- Infrequent and little important blends, less than one per month (250 cubic metres).

French Government, Gergy :- Infrequent, less than one per month (250 cm.)

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6) Southern district.--

Raffineries de Berre, Berre (visited Febr.1936) :- Infrequent blends, less than one per month (500 cubic metres).

Compagnie Générale des Pétroles, Marseille :- No blends have been carried out since a very long time.

Société Générale des Huiles de Pétrole, Lavera :- 3 to 4 blends of 100 cubic metres a month.

Compagnie Industrielle des Pétroles, Frontignan :- 4 to 5 blends a month, (100 cubic metres).

Standard Franco-Américaine de Raffinage, Port St.Louis du Rhône :- 4 to 5 blends per month (30 cubic metres).

Lille-Bonnières & Colombes, Port St.Louis du Rhône :- One blend per month (50 cubic metres).

Jupiter, Port St.Louis du Rhône :- 10 to 12 blends, of very little importance, (10 cubic metres). Are going to increase their production. A new tank is being erected to remedy the situation.

7) Southern-West district.--

Desmarais Frères, Blaye :- Not working yet.(Will be starting directly).

French Government, Bordeaux :- 3 blends every two months (140 cubic metres).

Consommateurs de Pétrole, Pauillac :- About 5 blends of 50 cubic metres.

A certain number of these plants do not work yet in a very active manner. In some of the plants in which the number of blends exceeds the authorized limit, you will note that the mixes are of very small volume, according to the quantity of Fluide which is used. Nevertheless we have made all our efforts to obtain that the number of blends be brought down to the limit authorized by the regulation

III. Method followed for the examination of men.

1) Outside of the complete clinical examination involving medical and occupational factors which could cause a man to be rejected from this work, I carry out in principle the following examinations : urine analysis, counting of white and red cells, test for haemoglobin by the Gower's process, sometimes completed by that of Tallqvist (which is rather incorrect) and at last taking of blood for test for stippling of red cells. For this test, I have always used the method which is outlined page 17 of your paper "A Study of the Hazards associated with the distribution and use of Ethyl gasoline (R.A. Kehoe & F. Thamann April, 1928) I have also used, with certain men, the method of Lehmann (au bleu de Toluidine).

I make these tests myself at home, where I have the necessary equipment available. You will remember that I had bought a microscope and a certain equipment for these tests. I prefer to carry them out myself, for it is important not to change the experimenter, and in this way I am sure that they are carried out in a correct manner, and I can take the results as a basis. This way of proceeding is also more economical for the Corporation.

At the beginning, I made systematically on each examination the test for stippling of red cells, but since a certain time I have only made some tests covering the men working on the busiest plants, considering the small volume and duration of the blends carried out in a certain number of plants. Up to the present time, I have not found any stippling of red cells on any man. On the other hand I have not made, just now, tests for counting of red and white cells. I have only made tests for haemoglobin.

I now intend, as regards most of the plants working since a certain time, to make a general control on all the men who have been carrying out a great amount of mixes for a sufficient period of time. In the course of the first six months of 1937, I will take up again all the haematologic examinations, and the tests for counting of red and white cells, haemoglobin and stippling of red cells, and I intend to publish, towards the middle of that year or maybe in the autumn, a paper involving my chemical and laboratory tests. This will be given for publication to one of our great medical newspapers, and of course I will submit it to you before. This will be therefore the first original document published in France on the results of Ethyl Gasoline activities. (In fact, Valentin's thesis involves only a very small amount of tests and it especially represents a general review of the question based on previous literature).

It would of course be desirable to include in this work the corresponding chemical controls and I was just going to write you on this subject when I received your letter.

I would like to ask you the following two questions :

1) Method of analysis of Lead in urine :

Which is, at the present time, the method you consider the best, taking into account its accuracy and the difficulties it incurs. Is it advisable to use the one outlined in your paper "The normal absorption of Lead" (Journal of Industrial Hygien, Sept., 1933; page 261 and following) or the method mentioned by the British Commission in their report dated 1930, or the method of Seelkopf and Taeger (Zeitschrift Exp. Med., 1933) which is used by Professeur Fabre, by his pupil Melle Lem, and which has been followed by Valentin in his thesis. Or should one have recourse to Cholak's spectrographic method.

2) Selection of a chemist :

It is evidently possible for us to ask, according to your suggestion, for Dodds' cooperation at the Middlesex Hospital, but there will always be a certain difficulty to send the samples and moreover there is a risk that the connection may not be very intimate between an English chemist and us. On the other hand, this would set a certain limit to the scope of researches in France.

Personally, and unless your opinion is different, I would prefer to apply to a French chemist. I wanted to do it several years ago on the demand of M. Lienhard (engineer of the Ethyl Export Corporation) but this had no result and M. Lienhard told me at that time that he had no credit to undertake such tests in France. This is why I had dropped the question temporarily, with the intention of taking the matter up with you some time; I think that time has come now for this.

It is to be wished, although Ethyl Fluid begins to be in the common use, that we have on hand a documentation gathered on the spot in French plants

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and supplied by competent French chemists.

In the actual troubled state of social conditions, we must always mind that an incident may be given greatly exaggerated proportions in the name of hygien, and this could seriously hinder our activities.

You tell me that you know of very few places where this delicate test is carried out in a correct manner. You can be assured that there is not a person more suspicious than I as regards the value of an experimenter. I know by experience how difficult it is to find a competent and conscientious chemist in whose results one can have confidence. However, I think that we can find here a chemist who would satisfy the requirements and whose figures can be relied upon.

Please excuse me for not giving you any name for the moment. I must think about it and consult several persons, for I hesitate at the present time between several chemists. On the other hand, I will have nothing undertaken before knowing if in principle you agree to my suggestion to carry out these tests in France.

As soon as this chemist is selected, I will ask Mr. Bevan to send me with this person to London for a few days in order to study in detail the work done by Mr. Doods. On the other hand, should one of your collaborators come to Paris, he could be of great help to us for the starting of this work. I think that this question should be decided as soon as possible, in order that we may have started within two or three months, and so that the work I intend to carry out until the middle or the end of this year can include a sufficient chemical part.

We shall start these researches of Lead elimination not only on workmen employed on the mixing plants but also on men working at refineries or whose work involves exposure to Lead poisoning, and on normal citizen and country subjects. We will then be able to repeat in Paris the researches which have been made in London on the Lead contents of the dusts gathered in various districts of the town.

I would be glad if you could answer me very soon on these various points and I will proceed immediately according to your instructions.

With greetings of the season,

Yours sincerely,

*Flotte*

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