

WASC-2397

Acetone/Cordite

WW I

21 BEACON HILL
MALDON
CM9 6HR
TEL: 01621 853291
email: hr@hbacon.plus.com

1st. February 2017

Acetone for Cordite manufacture in WW1

In the course of researching my wife's family history I have been especially interested in her paternal uncle, David Alliston Legg (1889-1969) who was an industrial chemist and bacteriologist.

Cordite had been patented in 1889 using acetone as a solvent then manufactured by a long chemical process. Some was imported from Germany. The outbreak of WW1 greatly increased demand for cordite – and hence acetone - for rifles and other light weapons.

While working for Dr. Chaim Weizmann (a Zionist and later first President of Israel) Alliston Legg, helped develop a biological process using maize which produced acetone in far greater quantities than any other means at that time. Weizmann appears to have gifted this discovery to the British Government who established factories initially in this country for the manufacture.

From a brief and very amateur exploration at the National Archive I found that in October 1915 a Professor Fernbach from the Pasteur Institute in Paris laid claim to ownership of the bacteria saying that Weizmann had been employed by a firm who worked in collaboration with him in 1910 and must have acquired the bacteria about that time. I could not find how this dispute was resolved but had it got to Court, the process might have been revealed to the enemy. My first question is, how was this dispute resolved? I guess that a 'political' solution was found.

In January 1916 Alliston was chosen by Weizmann to take test tubes containing the bacteria to the British Acetates plant in Toronto via New York. His wife, Winifred carried the test tubes in a small case. Her autobiography records how, despite prior agreement between governments, she had great difficulty in getting the tubes through customs unopened. British Acetates produced enormous quantities.

Production continued in this country but there was concern that the import of maize was both costly and dangerous. It was found the horse chestnut could be used instead of maize – “every ton of Chestnuts would relieve half a ton of maize for food”. In August 1917 the Department of Education issued Circular 1009 (see below) to selected schools asking that pupils be allowed time off to “assist the war effort” by collecting horse chestnuts which were to be put in 1 bushel sacks and sent to the Ministry of Propellants. Schools would receive payment. Winston Churchill among others was involved in this.

Clearly, the Government was greatly indebted to Chaim Weizamm who had constantly petitioned the government on behalf of Zionists. My second question: was the Balfour Agreement of October 1917 a payback albeit that it was in the form a letter to Lord Rothchild?

It is thought that Alliston received a pension of £200 a year from Weizmann. He latter settled in the United States and at the time of his death held thirty-seven patents in his own name.

BOARD OF EDUCATION,
VICTORIA AND ALBERT MUSEUM,
EXHIBITION ROAD,
SOUTH KENSINGTON,
LONDON, S.W. 7.

SIR,

THE Board of Education have been requested by the Minister of Munitions and the Food Controller to bring the following scheme to the notice of School Authorities, Governing Bodies and Teachers, and to request their assistance in giving effect to it.

A considerable quantity of grain is at present being used in certain industrial processes which are essential to the prosecution of the war. In order to set this grain free for human consumption, experiments have been made to discover a substitute which could be utilised for the industrial processes concerned, and a substitute suitable in every respect has been found in the horse-chestnut. The experiments prove that for every ton of horse-chestnuts which are harvested, half a ton of grain can be saved for human consumption. The horse-chestnut, therefore, though itself totally unfit for food, can be utilised indirectly to increase the national food supply.

It is therefore urgently necessary that this year's crop of horse-chestnuts should be harvested. In present circumstances it is felt that school children could give most valuable assistance in collecting the chestnuts, and by so doing make a definite contribution to national efficiency. It is suggested, therefore, that the Governing Bodies, Managers and Teachers of Schools should organise the efforts of the children for the purpose. To effect this a small committee might be formed in connection with each school, or convenient group of schools, to undertake the organising work in connection with the scheme in the district concerned and to answer inquiries.

It is understood that in many districts the scheme has already been taken up by private individuals, and it is obviously desirable that all persons undertaking work in connection with the scheme should co-operate with one another:

One of the duties of such a Committee as is suggested above would be to see that the chestnuts gathered in their district are collected in a heap in some convenient place, preferably under cover; exposure to the weather will not, however, damage the nuts, provided that the interior of the heap does not heat.

The nuts suffer no harm from lying on the ground where they fall. They may therefore be collected either from the trees or from the ground after being shed, as may be the more convenient. Before being deposited at the collecting station they should be freed from the outer green husk, the shells of the nuts being left intact. If the husks are not removed, heating of the heaps will certainly take place.

A limited number of sacks and baskets are available for the collection of the nuts, and where there is any difficulty in obtaining bags or baskets locally, application should be made to the Director of Propellant Supplies, Ministry of Munitions, 32, Old Queen Street, London, S.W.1.

When the collection is complete the Committee should inform the Director of Propellant Supplies as above, stating the estimated quantity of the collection, and the Ministry of Munitions will arrange to remove the nuts and forward them to the factories in the course of the winter.

Further copies of this Circular can be obtained on application to the Secretary, Board of Education, Victoria and Albert Museum, Exhibition Road, South Kensington, London, S.W.7.

I am, SIR,
Your obedient Servant,

A. A. Selby-Bigge

From: Harry Bacon <hr@hbacon.plus.com>
Date: 3 March 2017 at 23:33
Subject: Weizmann & Acetone
To: Len Stuart <romeland13@gmail.com>

Dear Len,

I promised to trawl back through my records to see if I have any additional information. I was surprised to find more than I had remembered but I guess that most will already be known to your historian colleague For example:

1. House of Lords Records Office: The Lloyd George Papers (Minister of Munitions: LG/D/1-LG/D/16 catalogue
2. National Archives catalogue search on "Acetone"
3. ditto search on "Weizmann + Lloyd George"

If not known to him, I should be pleased to pass on my copies as age and poor health prelude me from further researches.

As previously mentioned , my interest arose from my wife's family history and especially her uncle Dr. David Alliston Legg who played a prominent part in Weizmann's work. About 10 years ago we visited Alliston's son, Douglas, in California and were shown a biography of Chaim Weizmann which included mention of Alliston Legg. The biography relates that towards the end the First World War Lloyd George offered Weizmann a peerage or substantial monetary award. He declined both but asked for a separate state to be created for the Israeli people. Lloyd George agreed hence the Balfour Declaration (1917) The biography says that in recognition of Alliston Legg's contribution to the research Weizmann agreed to pay him £200 per year.

Also, we have Douglas Legg's edited version of Alliston's first wife's life story. This records:

"While working for Weizmann, Alliston discovered a process for putting a microbe into a corn mash causing a fermentation which produce acetone.

Acetone was used for the production of cordite, an explosive used in munitions. The process produced acetone in quantities far exceeding that of any other method used at that time.

Weizmann gave this process to the English Government and Gooderham and Werts Company gave their distillery in Toronto, Canada for the process. Dr. Weizmann chose Alliston to take the test tube with microbes to Toronto and, with Dr. Horace Speakman, to lead a team of chemists and engineers in constructing the facility and starting the process. This plant, British Acetates, produced acetone in enormous quantities and was credited by the British Government as being a major factor in the defeat of Germany in World War 1. Alliston and I had married that December (i.e. 1915) but the Government said wives could not go. Dr. Weizmann insisted and the government relented and I finally got my fare paid. We sailed (May 1916 I believe HB) on the Tuscania and the boat was chased by submarines and we were 3 days dodging around the English Channel and I was so seasick I couldn't get out of bed.

"We were given a wonderful state room with sitting room All this was very exciting for a pair of youngsters. It took us 17 days to cross instead of the usual 5 as the ship was being chased by submarines all the way

"We had a letter from Government to Officials in New York asking that they allow the test tubes to go through without opening. I had carried them in a small suitcase. They had wanted me to have them strapped around my waist under clothes and so smuggle them in. If the microbes were exposed to air it was destroyed but my mother refused and I also. America was neutral at that time. It took all day to discuss but finally they tore one corner of wrapping and let us through."

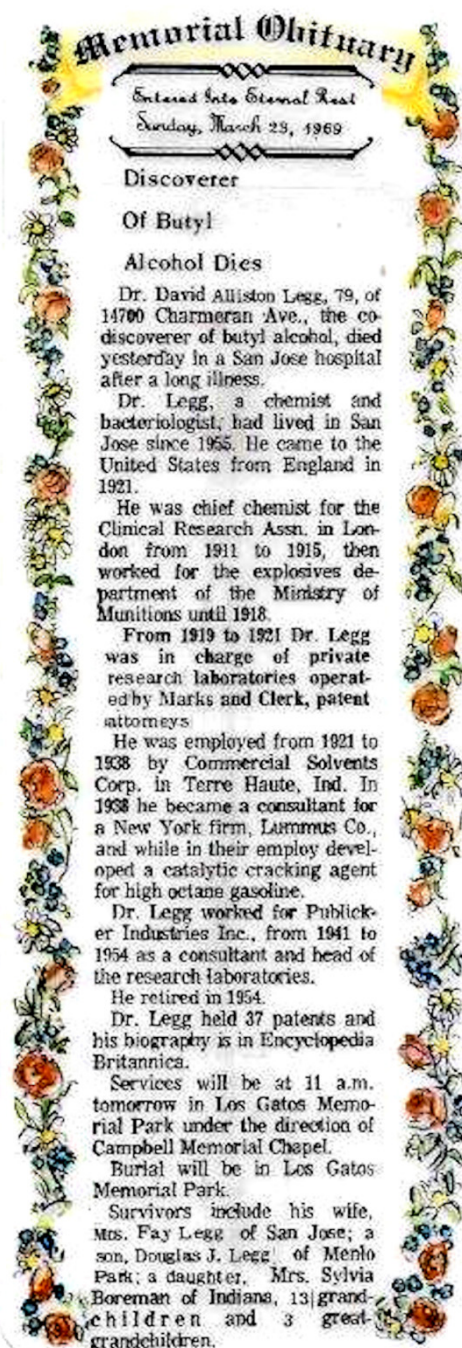
The family finally settled in America but the intensity of Alliston's work and other factors resulted in the later break up of the marriage. I attach copy of Alliston's Memorial Obituary that gives some idea of his achievements as a bio-Chemist.

As to the use of Horse Chestnuts, A confidential minute of 31 May 1917(ED24/2031) says " Every ton of horse chestnuts would liberate half a ton of maize for food"

Thanks again ,Len, for your full reply to my initial letter. I hope the above may in turn be of interest to you and your colleagues

Kind regards
Harry (Bacon)

A TRIBUTE
published in the pages of
THE SAN JOSE MERCURY
SAN JOSE, CALIF.
MAR 24 1969



Memorial Obituary

Entered into Eternal Rest
Sunday, March 23, 1969

Discoverer
Of Butyl
Alcohol Dies

Dr. David Alliston Legg, 79, of 14700 Charmeran Ave., the co-discoverer of butyl alcohol, died yesterday in a San Jose hospital after a long illness.

Dr. Legg, a chemist and bacteriologist, had lived in San Jose since 1955. He came to the United States from England in 1921.

He was chief chemist for the Clinical Research Assn. in London from 1911 to 1915, then worked for the explosives department of the Ministry of Munitions until 1918.

From 1919 to 1921 Dr. Legg was in charge of private research laboratories operated by Marks and Clerk, patent attorneys.

He was employed from 1921 to 1938 by Commercial Solvents Corp. in Terre Haute, Ind. In 1938 he became a consultant for a New York firm, Lummus Co., and while in their employ developed a catalytic cracking agent for high octane gasoline.

Dr. Legg worked for Publicker Industries Inc., from 1941 to 1954 as a consultant and head of the research laboratories.

He retired in 1954.

Dr. Legg held 37 patents and his biography is in Encyclopedia Britannica.

Services will be at 11 a.m. tomorrow in Los Gatos Memorial Park under the direction of Campbell Memorial Chapel.

Burial will be in Los Gatos Memorial Park.

Survivors include his wife, Mrs. Fay Legg of San Jose; a son, Douglas J. Legg, of Menlo Park; a daughter, Mrs. Sylvia Boreman of Indiana, 13 grandchildren and 3 great-grandchildren.

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