age, and is 1.4° higher than the previous highest mean minimum, 39.4° in 1846, whilst there have only been three previous Januarys with the mean minimum as high as 39° . The mean minimum of 40.8° is in agreement with the average minimum at the begin-ning of May or end of October.

The lowest mean temperature for January during the last seventy-five years is 31.6° in 1879, and 31.8° in 1881, which, with January this year, gives a range of 14° for the possible mean temperature.

In January, 1916, there were three frosty nights at Greenwich, the lowest temperature being 29° on January 23, and in the last seventy-five years January, 1884, had only one frost, and January, 1872, had two frosts, whilst the other Januarys during the long period with as few as three frosty nights were 1851, 1853, 1875, and 1890. In twelve Januarys there have been as many as twenty or more frosts, and in 1879 there were twenty-six frosts. There has been no January with more than seventeen frosty nights since the memorable frost of 1895.

There were twenty days at Greenwich with the temperature 50° or above, and the nearest approach to this in previous Januarys since 1841 is seventeen days as warm as 50° in 1890, whilst there is only one other instance, in 1899, with as many as fifteen days as warm.

The highest temperature recorded at any time in January during the seventy-five years is 57° on January 28, 1843, and this temperature was reached both on January 1 and 17 this year. The two closing days of the month were the only occasions on which the maximum or highest day temperature was below the normal; the lowest maximum temperature was 42° on

January 31. There have only been two Decembers in the last seventy-five years with a higher mean than in January, 1916, the instances being 47.2° in 1852, and 45.8° in 1868, and in December, 1912, the mean was 45.7° , identical with last January. The only February with so high a mean was in 1869, the value being 45.8°.

Previous observations to those of the new series from 1841 made at Greenwich show a mean temperature of 44-6° in January, 1834, which is the highest during the last 100 years, and 1-1° lower than January, CHAS. HARDING. 1916.

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Lipoids and Vitamines in Margarine and Butter.

In the issue of NATURE of June 3, 1915, there is an interesting discussion on the presence of "vitamines" in butter and in margarine. The writer of the article on "Modern Substitutes for Butter" states that butter fat is the only fat or oil in which American investigators have shown the presence of vitamines, and he further states that vitamines are closely associated with lipoids, and that it is doubtful whether vitamines could be formed during lactic fermentation.

"S. H. B.," stating as a fact that vitamines are formed by lactic fermentation, concludes that butter and margarine, by being both churned with skim milk, should be equally rich in the precious substances mentioned.

Now there is no evidence about the quantities of vitamines in butter and in margarine. But recent investigations of my own throw some light on the quantities of lipoids in those substances, and with those lipoids the vitamines are closely allied. To find the lipoid content, I proceed as follows :- The liquid fats, oils, butter, and margarine are shaken with an equal volume of hydrochloric acid (sp. gr. 1-19). After the separation of both liquids, part of the acid is let off and diluted with water. The precipitate of lipoids

is collected and washed with water, dried, and weighed. I found in 100 c.c. of liquid :-

-		
Butter gr. 0'400	 Margarine gr. 0'975	 Sesame oil gr. O'100
Pianta (Vegetable butter) gr. 0'475	 Klappa (Vegetasle buiter) g [.] . 070	 Bran-butter (Vegetable butter) gr. I 125
Butter-fat (Filtrated) traces	 Olive oil (Sublime ooo) traces	 Arachis oil (Cold pressed) traces
Coconut oil (Kaffinated) traces	 Cod liver oit (cold pressed) traces	

The first conclusion from these figures is that the seat of the lipoids in butter and butter substitutes is not the fat, but the solution with which it is mixed and emulsified.

Further, it is obvious that of the ± 0.075 per cent. of lecithin in milk only a part is enclosed in the butter. The remaining lipoids in the skim milk are responsible for the greater part of the lipoid content in margarine. Egg yolk, if added, may prove another source of lipoids in margarine. The high figure for margarine as compared with those for "vegetable butter" may be due to that source.

There is another store of lipoids in the seeds of plants, which is turned to profit in a recent Dutch patent process. There was a serious obstacle in the fact that lecithin enters into chemical combination (Hoppe Seyler, Juckenack), or absorption (Rob. Cohn), with albumins.¹ In order to set it free the seeds are treated with diluted acids or alkalis. "Branbutter," e.g., is made by treating bran with diluted lime water. The solution thus obtained consists of water, glutelin, lipoids, and salts. With it a mixture of arachis oil and raffinated coconut oil is thoroughly emulsified. To this emulsion is added skim milk, and the butter separated after ripening. Working on these lines a vegetable butter with 1.125 gr. of lipoids in 100 c.c. could easily be obtained. By changing the proportions a higher content may be reached if desired.

It is obvious that a "vegetable butter" of this kind in its lipoid content, and probably also in its vitamine content, is more than equal to butter. As a fact, it has a most marked advantage as a part of the daily diet.

Anyone interested in the process above mentioned and its possibilities as to making butter-like, and even cheese-like products, is invited to correspond with the writer. Sneek, Holland. I. DE RUITER.

Science Scholarships.

THE leading article in NATURE of February 17 (p. 671) quotes Dr. Shipley and Mr. Roberts, who say, in reference to the candidates for science scholarships at Cambridge :--- "No candidate in natural science who reaches the necessary standard of ability is likely to be rejected. But the supply of candidates of sufficient ability is not so great as it should be."

I have not had the opportunity of reading the original letter, but this quotation contains two points on which I may be permitted to make a few remarks. I feel entitled to ask this privilege as between 1890 and 1904 I took a share in the work of scholarship examination, and I am now able to review my work in the light of a more general experience.

First, as to the type and standard of the questions that are set to the candidates, these appear now to

¹ The absorption of lipoids by albumins could be observed by heating sesame oil with bran to rco[°] C., by which the oil is proved to have lost half its lipoid content.

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