

the observations of Geelmuyden on carbohydrate formation in the animal body, and on the intermediary metabolism in diabetes, fit in remarkably well with Milne and Peters' views ("Ergebnisse der Physiologie," 1923, Bd. 21, I, p. 274; and *Klinische Wochenschrift*, 2. Jhrg., No. 36, 1923, p. 1677). He also comes to the conclusion that in diabetes a hyperproduction of sugar occurs, due to the uncontrolled action of adrenalin. He interprets the beneficial effects of insulin as due to inhibition of sugar conversion, and he explains the rise of respiratory quotient after insulin, not by an increased burning of sugar, but as retardation or cessation in formation of carbohydrate from proteins and fats. In other words, he also believes that the pancreas regulates the conversion of glycogen and fat into sugar.

I must defer a more detailed presentation of this subject to a later date, and for another place, but I would like to emphasise here that there exists enough morphological as well as experimental evidence to question the independence of the islands in the pancreas and their conception as organs of internal secretion which are essential for the combustion of sugar.

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#### The Effect of Dispersion on the Interference Figures of Crystals.

CRYSTALLOGRAPHERS are familiar with the fact that the colour-lines in the figures shown by crystal-sections between crossed nicols in the polarisation microscope often deviate to a notable extent from the so-called "isochromatic lines" discussed in the textbooks of physical optics. The difference is attributed to the dispersion of the optic axes, and its character enables the type of dispersion to be determined (for details, see for example Tutton's "Crystallography"). Though the phenomenon is thus well known and of considerable importance in practical work with crystals, I have found no record of any attempt to determine *theoretically* the form of the true isochromatic lines for any specified dispersion. Possibly it has been thought that the task would be too complicated and laborious to be worth undertaking. It may, therefore, be worth while to point out a fairly simple way of approaching the matter.

The general principle determining the observed position and colour-distribution of interference-fringes in white light is that the *group*-velocity and the group-refractive index should be considered, and not the wave-velocity and the wave-refractive index. Thus, for example, if a thick parallel plate of glass be placed in the path of one of the interfering beams of a Michelson interferometer, and white light is used, fringes may be observed when the retarding plate is compensated by increasing the air-path of the other beam; they are then less distinct but far more numerous than without the plate, and the colour-distribution is determined by the fact that the compensation for different group-wave-lengths occurs for different retardations.

Taking now the case of a crystal-plate between crossed nicols, the so-called "isochromatic surface" is derived from the equation  $\rho(\mu_1 - \mu_2) = \text{constant}$ , where  $\rho$  is the linear-path within the crystal and  $\mu_1, \mu_2$  are the two wave-refractive indices. If, however, instead of  $\mu_1, \mu_2$ , we consider the group-indices  $\bar{\mu}_1, \bar{\mu}_2$ , the sections of the surface  $\rho(\bar{\mu}_1 - \bar{\mu}_2) = \text{constant}$  would give the lines for which the relative retardation has specified values for any given *group* in the spectrum, and these may be expected to follow much more closely the colour-lines actually observed in the polariscope.

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NO. 2830, VOL. 113]

#### The French Physical Society's Exhibition.

DANS la chronique consacrée à l'Exposition de la Société de Physique (NATURE, 5 janvier), on peut lire l'appréciation suivante: "The exhibits of the Bureau international des Poids et Mesures and the Conservatoire des Arts et Métiers were somewhat disappointing." La chose était fatale; pour notre compte, après avoir un peu hésité, nous nous sommes décidés à participer à l'Exposition, surtout pour lui manifester notre sympathie. Mais il ne pouvait être question de transporter nos instruments très délicats, lourds et volumineux, qui, malgré toutes les précautions qu'on aurait pu prendre, étaient susceptibles de subir des avaries irrémédiables.

Pour marquer la trace de cette partie de notre activité, qui est la principale, nous nous sommes bornés à exposer des photographies, et pour le reste, nous avons montré quelques appareils peu encombrants et d'un transport facile, quelques modèles d'étalons, et des diagrammes condensant les résultats obtenus. Mais mes collaborateurs se sont succédés dans notre stand pour donner les explications nécessaires, et ainsi, nous avons suppléé dans la mesure du possible à ce que notre exposition avait d'un peu sommaire.

Ajoutez à cela l'impérieuse nécessité, en raison de la modicité de notre dotation, de vivre avec une stricte économie, et vous aurez toutes les raisons pour lesquelles notre exposition était "somewhat disappointing." Mais j'ai constaté moi-même que, lorsque les visiteurs prenaient la peine de poser des questions, ils obtenaient des explications abondantes, qui les satisfaisaient pleinement. CH.-ÉD. GUILLAUME.

Pavillon de Breteuil, Sèvres, 8 janvier.

#### Clean Milk.

MY attention has been directed to the article on "The Problems of Pasteurisation" in NATURE of December 15, p. 853, in which it is stated "Clean milk is necessarily expensive." "Certified" milk (although cheaper than beer) is necessarily expensive owing to the high cost of freight for milk in bottles, the comparatively high cost of bottling on the farm, but above all, owing to the cost of maintaining a herd of animals no one of which reacts to the tuberculin test. But the production of milk that is clean costs but a trifling amount more than that of milk that is not clean.

All milk that is offered for liquid consumption should be at least "Grade A" milk, not necessarily "Certified" or "Grade A tuberculin tested." Any farmer can produce it in any premises. The idea is prevalent that "Grade A" is special milk, beyond the ability of the ordinary farmer to produce. Yet few farmers will admit that their product is not clean. Then why do they not take the trouble to obtain a license from the Licensing Authority to dispose of it as Grade A milk and thereby obtain an advantage over the sellers of market milk through the assurance given to the consumer, and why does any intelligent consumer remain satisfied to purchase milk in regard to which he does not obtain that assurance?

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#### The Continuous Spectrum of Hydrogen.

A CONTINUOUS radiation from hydrogen beginning in the blue violet and extending into the ultra-violet is well known and has been commented upon in the columns of NATURE before. Recently we have developed it with unusual intensity and observed it up to the yellow-green in discharge tubes having hot cathodes and operating at potentials as low as 100 volts. Its colour to the eye is a brilliant blue,