

Dr. J. P. van der Stok to the Proceedings of the Royal Academy at Amsterdam, "On the diurnal variation of the wind and the atmospheric pressure and their relation to the variation of the gradient." He criticises the method, adopted in previous investigations, of attempting to determine the variation of the wind from the variation of the gradient of pressure, and, regarding it as too laborious and affected with uncertain errors, attempts to determine the gradient from the observed variation of the wind. It would be interesting to institute a comparison between this method, that of utilising hourly observations of pressure at three stations, adopted by Tsuiji, and the general method based upon the regularity of the semi-diurnal wave of pressure.

Dr. van der Stok finds it convenient to assume that the semi-diurnal variation of the wind has the same phase angle as would be indicated by the theoretical application of the general method, and deduces the value of the coefficient of friction, k , which will ensure agreement between observation and theory in this respect. He then utilises this value of the coefficient to deduce the diurnal variation of the gradient of pressure from the observed diurnal variation of the wind. It seems desirable to consider in this application the difference, emphasised in a recent paper by Sandström, between friction due to motion over the rough surface of the earth and sea and the frictional effect which arises from the difference in direction and velocity between the wind at the surface and that at some distance above it. The results used in the investigation are the hourly observations, presumably estimates and not instrumental records, at de Bilt for five years 1903-1908, and the four-hourly observations at the Terschellingerbank Lightship for 25 years 1884-1908. The values found for k show a general agreement with those found by van Everdingen from the incurvature of the wind at de Bilt, but the value for Terschellingerbank is 50 per cent. larger. The coefficient shows a regular annual variation, with the maximum during autumn and winter, the minimum during spring and summer, an interesting result which ought to be compared with the values for inland stations. The author criticises the results of the analysis at St. Helena, on the ground that the wind-vector turns in a clockwise instead of in a counter-clockwise direction, but a reference to Dines's discussion of these results shows that, except for certain small irregularities in the night, the vector rotates in a counter-clockwise direction throughout the year. The vector of the variation of the horizontal magnetic force at St. Helena rotates in a clockwise direction except in July. E. GOLD.

REPORT OF THE GOVERNMENT CHEMIST.

IN his report upon the work of the Government Laboratory for the year ended March 31, 1911, the principal chemist notes that the laboratory has now been constituted a distinct establishment under the Treasury. This is certainly a more appropriate arrangement than the previous one, under which the control was vested in the revenue authorities, for since the laboratory now serves many other State departments besides the fiscal ones, the control in question had become somewhat of an anachronism.

Last year the total number of samples dealt with was 186,044, as compared with 170,033 in the preceding year. The report describes the nature of these, with explanatory notes and statistics. As usual, they included the most diverse kinds of articles, from "standard" bread to poisoned salmon. From among the items of more or less general interest mentioned in the report we extract the following.

Beer and brewing materials are regularly tested for the presence of arsenic, and 41 out of 638 samples were found to contain arsenic in excess of the prescribed limit. Steps were taken in these cases to prevent the contaminated article being sent into consumption, and to trace the source of the arsenic. Usually this was found in the fuel used for drying the malt.

Two interesting cases of fish-poisoning are noted. In one instance dead trout were found (Kensley Brook, Tamar and Plym District), and analysis of the water showed that the brook had been contaminated with ammonia from a gas works. In the other case dead salmon had been found in the Conway district, and as there are lead mines near it was thought that the fish might have been poisoned by drainage containing lead. On analysis, however, zinc, and not lead, was discovered in the salmon, as also in the river water; this served to indicate the source of the pollution and explain the destruction of the fish.

One curious question referred to the laboratory was whether the composition of a particular clay was such as to distinguish it from the exempted "common clay" of the Finance Act of 1909-10; the report is silent as to the conclusion arrived at. Questions connected with the pigments, paper, and gum used in making postage and other fiscal stamps were also investigated. At the house of a coiner, it is stated, a plate and apparatus were found, all ready for the production of illegal stamps. "His productions were somewhat crude," the principal chemist remarks; "but were sufficiently good to deceive an unobservant person, especially in a poor light."

In connection with dangerous trades a number of pottery glazes were examined. They included a series of forty-eight taken from works where lead-poisoning had occurred, and it is a significant fact that except in two or three cases, practically the whole of the lead in these samples was "soluble" lead. Large proportions of lead were also found in dust collected from various factories, other than potteries.

Space allows mention of only one more of the many interesting matters to be found in the report. A question arose respecting the authenticity of a portion of an "Account Book of Revels" of the years 1604-5, preserved in the Public Record Office. This document is a manuscript containing details of expenses incurred in producing certain plays, including *Othello*, respecting the production of which at so early a date there has been much controversy. Suspicion had been cast upon the manuscript, the suggestion being that the entries in question had been made about forty years ago, just before the book had passed into the custody of the Record Office. "After a searching microscopical and chemical examination of the ink and paper in different parts of the document," the principal chemist was able to report that in the character of the ink, the depth to which it had penetrated, or the degree of fading, there was no evidence whatever of any difference between the impugned writing and that in other parts of the document. C. S.

PRINCE BONAPARTE'S AIDS TO SCIENTIFIC WORK.

THE announcement of the gift of 250,000 francs to the Paris Academy of Sciences by Prince Roland Bonaparte has already been made in these columns. The issue of the *Comptes rendus* of the Academy for November 27 includes a copy of the letter from Prince Bonaparte to the president of the Academy, M. Armand Gautier, announcing his intention, and also the remarks of the president after reading this letter to the meeting of the Academy. A free translation of both is subjoined.