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A seasonal variation in the excretion of phenols.

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By total urinary phenols we mean substances which react with the reagent in the Folin and Denis colorimetric method. The subject studied in this experiment abstained from meat, fish, coffee, tea, alcohol and tobacco; an average figure was taken for a four day sample during such weeks in which there was no sickness, accident or vacation.

Although the level for 1923 is higher than that for 1924, yet, within each year we find about 100 mg. more phenols excreted per day during the summer months of June, July and August, than during the winter—meaning December, January and February; the spring and autumn show intermediary figures, and those for the autumn would probably have been higher had not September been vacation-month. If we combine the two years of 1923 and 1924, we find the following:

Spring, 60 days, average 411 mg.;
Summer, 71 days, average 463 mg.;
Autumn, 60 days, average 388 mg.; and, finally,
Winter, 84 days, average 345 mg.; or for 3 winters,
124 days, average 353 mg. of phenols.

As to the cause of such a seasonal variation we at first thought that the analyses were perhaps carried out at somewhat higher temperatures during the summer and that this might be a factor. Tests showed that a standard set at 20° Centigrade compared with a similar standard set at 30° Centigrade gives an increased color in the latter equivalent to a 20 per cent error; however, a certain sample gave 333 mg. of phenols at 30° Centigrade and 338 at 20° when compared with the same standard at the corresponding temperatures. We always kept the standard and the unknown at the same temperature, so this error was not introduced.

Secondly, because the phenols in an exaggerated manner followed the Nitrogen fluctuations of 1924-25, we have included the records of the winter 1925-26, which demonstrates that Nitrogen

is not the main factor; for with 12.66 g of N per day for the winter against 11.75 for the summer, the phenols remain low. Likewise, nothing definite may be concluded from the urinary volumes, or from the number of defecations per day, which latter were almost the same per season.

Furthermore, we have no direct evidence that with the diet employed one ingests more phenol-forming bacteria during the summer than the winter, nor that the pH of the intestine differs markedly with the season.

Finally, we must consider the seasonal difference in the intensity of sunlight. Koch and Reed[1] found that in about two-thirds of the dogs which they studied, an exposure to ultra-violet light gave higher figures for substances of probable phenol character in the blood, which substances reacted with the uric acid reagents of Benedict or of Folin. Also, since tyrosin is acted upon by sunlight to give melanins, and by bacteria to give phenols, it may be worth while to investigate further if the extra sunlight has to do with the higher phenol excretion during the summer.

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Influence of some salts which change P. D. on the phagocytosis of pneumococci.

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It has long been known that virulent strains of pneumococci or other bacteria are not readily ingested by leucocytes and that avirulent strains are generally ingested readily. It has also been established that the presence of acids, alkalies, salts and other reagents modify the velocity or the extensiveness of phagocytic reactions.

In studies on the parallel relations between virulence, electrophoretic potential difference (P. D.), agglutinability and other characteristics of bacteria, strains of pneumococci of different

[1] Koch and Reed, *A. J. Physiol.*, 1926, lxxv, 351.