latter at first reversibly and later irreversibly, probably by digestion.

3. It is possible that further study of the nature of the insulin-enzyme reaction will help to decide whether proteolytic enzymes can act without the formation of an intermediate compound between enzyme and substrate.

205 (2728)

Influence of Ultra-violet radiations on basal metabolism in children.

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When malnourished children are exposed to ultra-violet radiations, there is often an improvement in their appetite and a gain in weight. The cause for this phenomena has not been satisfactorily explained. Until recently the impression has been that there is a concomitant rise in the basal metabolism. Otto Kestner[1] and his co-workers have demonstrated that there is an immediate rise in the basal metabolism, which, as far as they investigated, remains elevated for only a short time. Therefore the present work was undertaken to ascertain whether this rise in the basal metabolism extended over a long period of time, and whether it bore any relation to the clinical results.

The investigation was carried on from the beginning of December to the end of March, a period when the intensity of the ultra-violet rays from the sun is not sufficiently strong to influence results. Three children on the Pediatric Service of the Mount Sinai Hospital were studied. Two were free from all organic defects, while the third had a simple goitre. To obtain comparative figures these children were observed in the hospital for a control period of one month. They were on a fixed calculated diet, and their basal metabolism was determined three times

[1] Kestner, Peemoller, Plaut, *Klin. Therap. Wchnschr.*, No. 44, Oct., 1923, p. 2018.

each week. The children were then subjected to ultra-violet radiations from a Hanovian Quartz Mercury lamp. The routine and diet were continued as before. Basal metabolism determinations were again made three times a week, each determination following the light treatment by twenty to seventy hours.

Case 1 received twenty treatments within twenty-four days. Case 2, due to the isolation of the ward, at first received treatment at irregular intervals. The first four treatments were given within one month, and the last eight within nineteen days. Case 3 received seven treatments within sixteen days. The duration of each exposure and the distance of the lamp varied with the individual's reaction. At first the distance of the lamp was twenty-four inches, and gradually decreased to sixteen, while the time of exposure was increased from three to fifteen minutes (anterior and posterior). All children became pigmented.

The Krogh basal metabolism apparatus was used, and the calculations were made from tracings. Three determinations were made each time and the final calculation was based on the lowest reading.

The results showed that there was no appreciable difference in the basal metabolism rate during the months of treatment and non-treatment. The variations of each basal metabolism determination were negligible. Comparing the average basal metabolism before and after treatment, there was no greater variation than two calories per kilo per twenty-four hours.

During the same period, two healthy ambulatory children from the out-patient clinic were observed and similarly treated. They returned three times a week for ultra-violet radiations, and once a week for basal metabolism determination. (Benedict apparatus was used.) The basal metabolism of one case remained stationary, while that of the other child fell twenty-four per cent after two series of treatments within three months. As their diet could not be controlled no definite conclusions could be drawn from these two cases.

The effect of ultra-violet radiations upon basal metabolism is probably dependent upon the individual's reaction to the rays. No increase was noted in the basal metabolism of these five children, nor was there any increase observed in that of two other children studied and treated at the New York Infirmary for Women and Children last April and May. In spite of the inten-

sity of the ultra-violet rays of the sun at that time of the year, which might have influenced the results, the basal metabolism of both children did not rise permanently. Although it rose after the fifth and third treatment, respectively, it then fell, the one case 11 per cent below the original level, and in the other thirteen per cent.

Conclusions: It is important to bear in mind the reactions of the individual, when considering the effect of ultra-violet rays on the basal metabolism. A prolonged rise in basal metabolism following ultra-violet irradiation, is apparently not the usual reaction, but may possibly be found in certain children. The explanation must be sought elsewhere, to account for the clinical improvement noted in malnourished children following irradiation.

206 (2729)

Observations on lytic principle of weak potency.

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Bordet and Ciuca[1] have demonstrated that an anticolon lytic principle of weak potency can be obtained from a strong one by addition of a very small amount of strong principle to *B. coli.* The quantitatively reduced lytic principle produces only slight lysis, and according to these authors induces generation of a *new* principle of weak potency. This transformation of a strong principle into a weak one is considered of a qualitative nature, since no matter what amount of this weak principle is added to *B. coli* only weak lysis occurs and a weak principle is generated. To explain these observations Bordet and Ciuca assume that the introduction of a quantitatively reduced lytic principle leads to its considerable dispersion among the bacterial cells. Therefore, each bacterial cell is only weakly impressed by this dispersed

[1] Bordet and Ciuca, *Compt. Rend. Soc. de Biol.*, 1922, lxxxvi, 295, and 1922, lxxxvii, 366 and 987.