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Seasonal periodicity in man: I. Basal metabolism; respiration; cardio vascular condition.

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Four normal persons, two men and two women, have served as subjects for this investiagtion. On each, the following observations were made once a week throughout the year (February, 1925—February, 1926) under basal conditions between 8 and 10 a. m. The observations and their apparent course throughout the year follow:

1. Oral temperature; no certain periodicity.
2. Reclining systolic pressure: all show a marked depression in the spring and in three cases there are also low points in midsummer and late fall—early winter.
3. Reclining pulse: lowest in summer.
4. Alveolar air:
   (1) Oxygen, uncertain, with perhaps a tendency to be lowest in summer;
   (2) Carbon dioxid, highest in the summer in all subjects and rhythmically coincident with the menstrual cycle in the women, the low points coming just before the onset of menstruation.
5. Pulmonary ventilation: both the tidal and minute volumes show a marked depression in the spring with a rise to maximum in late summer and early fall.
6. Expired air: the percentages of oxygen and carbon dioxid vary inversly, the former showing a marked low point in spring and a maximum between July and September, while the latter is highest in the spring and lowest during late summer and early fall.
7. Carbon dioxid per minute: no evident periodicity.
8. Oxygen per minute and calories per square meter per hour: lowest in the period, July to September.
9. Respiratory Quotient (non-protein): with one exception seems to be highest in the summer and early fall.

Under the same basal conditions and either just preceding or following the above determinations 20 cc. of blood were taken from an arm vein. Most of this was used for other determinations to be reported on later, but the following may be mentioned here:

10. Blood count:
    (1) Red cells—increase to a maximum during the summer;
    (2) White cells—highest in the spring and lowest during the summer;
    (3) Differential white count—no evident periodicity.
11. Blood gas capacity:
    (1) Carbon dioxid—maximum in spring and fall with low points between;
    (2) Oxygen—maximum during summer.

Immediately following the above determinations, which were made while the subject was reclining (including the taking of the blood sample), the subject arose and served for the following additional determinations:

12. Standing pulse rate and systolic blood pressure and the pulse rate after a standard exercise: these values show no evident seasonal periodicity common to all subjects, though each one shows large and somewhat rhythmical fluctuations; the same applies to the cardio-vascular rating of Schneider, which is computed from them.

13. Vital Capacity: there seems to be a low point in the early summer and spring and a maximum in the fall.

14. Weight (Stripped): shows no periodicity.

As was indicated above, enough blood was taken from each subject under basal conditions to allow a rather complete blood analysis. Each subject also collected for analysis a twenty-four hour urine on the preceding day. The results of the blood and urine analyses will be reported at a later date.

The work is being carried through a second year; the above results should, therefore, be accepted only tentatively until the additional data are at hand.