cost of total-carbohydrate conversion to protein in *Pseudochlorella* under the cellular volume-increase process. *Chlorella* 211/8K. gives more doubtless experimental support on this shift-reaction at low temperature by virtue of the authoritative responses vested upon the strain in fuller details.

Contrasting at *the upper* temperature-shift, a weak synthesis of DNA without cell-division is observed. The accompanying nuclear-mitosis is evidenced by Feulgen-nuclear reactions (-communicated elsewhere) showing many colour-centres per cell, which are yet seldom observed at *the lower* temperature-shift. The block of cell-division under such nuclear-mitotic condition may therefore be explained that at higher temperature the process stands not only on the sufficient DNA-production, but upon another factor that lowers RNA-level associated with plasma-divisions also. Gross and Jahn (1962), however, have given an hypothesis on the possibility of the formation of some thermo-stable or, under certain condition, thermo-labile proteins responsible for *Chlamydomonas*-reactions to thermal-stresses.

But, based upon the major photosynthetic process of the autotropic cells, subsequent experiments with promoter substances as co-factors or co-substrates (-communicated elsewhere) have developed the present idea on the nucleic acids-level of the cellular metabolism to give satisfactory explanation to this modern issue on the regulatory temperature reactions.

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2. Gross, J. A. and Jahn, T. L., *J. Protozoo.*, 1962, **9**, 340.

USE OF RADON MEASUREMENTS TO DETERMINE SOURCE OF THE SOUTH-WEST MONSOON CURRENT OVER THE ARABIAN SEA

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RAMA[1] has suggested that radon (half-life 91 hours) measurements over the Arabian Sea can be used to determine whether the south-west monsoon current is primarily of northern hemisphere origin—from north-east Africa and Arabia or of southern hemisphere origin—south-east trades which have crossed the equator. The basis of this suggestion is that the air from across the equator would be poor in radon, while the air from north-east Africa and Arabia would be rich in radon. In a paper on "Radon in monsoon current" Rama[2] presented results of radon measurements at the deck-level of ships and showed that in the region of the south-east trades, the radon concentration ranged between 2 and 4 dpm/m^3, while that over the Arabian Sea was often ten times as much. The following questions are relevant regarding Rama's suggestion :

(*a*) Is the air mass over the Arabian Sea not adulterated ?

During the monsoon months (*i*) there is presence in the surface layers of a belt of moderate to strong south-westerly winds 200–500 km. wide off the Somalia-Arabian coast between about 6° and 18° N and (*ii*) a trough of low pressure extends from inland Somalia across south-east Arabia to the main heat—low over West Pakistan. The International Indian Ocean Expedition (IIOE) results have shown that the south-westerly to westerly air over the Arabian Sea is moist and has unstable lapse upto about 1·0 to 1·5 km. and that there is above it drier air with nearly dry adiabatic lapse on some occasions with an inversion between the two air masses and less moist air with nearly saturation adiabatic lapse and with or without an inversion between the two air masses on other occasions.[3,4] To the west of the axis of the trough there will be relatively dry continental air with high radon concentration ; to the east of the axis the drier radon-rich continental air would be drawn along with the south-westerly to westerly moist air with relatively much less radon or which is poor in radon.

Further, the air from across the equator which has travelled within about 200–300 km. of the African coast south of about 6° N. can also have more than 2-4 dpm/m^3 radon concentration as a result of the radon-rich air which has travelled over the African coast, being drawn north-eastwards along with the radon-poor south-east trades or deflected trades air.

Thus over the Arabian Sea there would not be ordinarily either unadulterated radon-rich continental air or radon-poor air from across or near the equator. The adulterated air would move to the west coast of the Peninsula under the influence of the prevailing pressure distribution. The radon concentration of this mixed air would be between that of the radon-poor deflected trades (2–4 dpm/m^3) and the radon-rich continental air (20–40 dpm/m^3).

(b) Taking it for the sake of argument that the air over the Arabian Sea is of continental origin with radon concentration of 20–40 dpm/m^3, is it possible for that dry warm air to pick up sufficient moisture from the cooler sea surface during its travel north-east to east over the Arabian Sea ?

The IIOE results have shown that when the warm continental air travels over the colder sea surface, an inversion (stable condition) develops right from the surface and little moisture is transported upwards due to presence of the inversion. On the other hand, moisture is added due to evaporation from the sea surface in the levels below the inversion when cooler deflected trades air with unstable lapse moves to warmer latitudes or areas north-east to east.[5,6] It is also seen from the IIOE results that marked changes in the depth of the moist current take place only within about 500 km. of the Western Ghats, the moist layer becoming about 6·0 km. deep on the west coast; there is absence of inversion and considerable rain also occurs on the coast.[3-5]

It is known that when the air from Arabia side presumably rich in radon reaches the west coast of the Peninsula in May, little or no rain occurs there. This is due to the fact that the dry warm continental air while travelling over the Arabian Sea is not able to pick up any appreciable amount of moisture. Further, the layer of the moist unstable deflected trades air acts as a reservoir from which moisture can be transported upwards by Cu and Cb activity,[5] while the stable layer of the dry continental air cannot do so.

(c) Can the westerly air over the Arabian Sea be always of continental origin, *i.e.*, from north-east Africa and Arabia ?

The westerly air over the Arabian Sea need not always be from Arabia side. It can be even from across the equator, the direction having changed from south-west to west under the prevailing pressure distribution. One can be sure of the source of the air mass only if its trajectory is traced backwards.[6] The IIOE results have shown that the direction of the moist deflected trades changes from south-west in the south-west Arabian Sea to west in the east Arabian Sea off the west coast, the speed decreasing at the same time from 20–35 kt. to about 10 kt.

In view of what has been stated above, it would appear that interpretation of radon results from the point of identifying air masses is not easy unless the latter are unadulterated. Radon results represent integrated effect of various factors and can be utilised for day-to-day forecasting only if they are considered with reference to the synoptic charts.*

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* A detailed paper on "Possible radon concentration over the Indian seas during the South-west Monsoon Season on the basis of climatic features of the area and utilisation of the Radon results for identifying air masses" has been submitted for publication to the India Meteorological Department.

1. Rama, *Ind. J. Meteor. Geophys.*, 1966, **17**, 651.
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4. —, *Proc. Ind. Acad. Sci.*, 1967, **66 A**, 306.
5. —, *Ind. J. Meteor. Geophys.*, 1966, **17**, 559,
6. —, *Ibid.*, 1967, **18**, 403