significant differences are predicted for other gases.

For a physical understanding of the meaning of Eq. 5 one must recognize that the exponential term consists of terms for two counteracting effects. First, the term *Mgd* corresponds to the increased potential due to a body force (gravity) at greater depths; this is quite equivalent to Fenn's barometric-column, and this means that in the gas phase (the barometric column) fugacity rises exponentially with depth because of the increasing weight of a column of gas. Second, there is a gravitational effect on the fugacity of the dissolved gas in the liquid due to the Poynting effect. This term accounts for the increased isothermal work (or Gibbs energy) needed to force a solute molecule into solution at elevated pressures, and the partial pressure, or fugacity, is the exponential of the chemical potential, which is no more than a partial molal Gibbs energy. In other words, the increased pressure augments the "escaping tendency" of the gas, such that at a depth of 10 km, despite the fact that the solubility of $O_2$ is essentially constant, the partial pressure is several times higher than that at the surface.

*Note added in proof*: A similar response to Fenn's report (*6*) was published while this technical comment was in press. Andrews has used a somewhat different approach to arrive at essentially the same result as here; moreover, he has shown an extension of the same treatment to a model of the distribution of radioactive heat sources in the earth's crust.

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**References and Notes**

1. W. O. Fenn, *Science* **176**, 1011 (1972).
2. I. R. Krichevsky and J. S. Kasarnovsky, *J. Amer. Chem. Soc.* **57**, 2168 (1935).
3. The fugacity is a property defined by G. N. Lewis to have units of pressure and to be the exponential of the better known chemical potential $\mu$, such that for any isothermal change
$$\Delta f_i = \exp \frac{\Delta \mu_i}{RT}$$
The fugacity has the useful property of becoming equivalent to the partial pressure in the limit of low pressure (ideal gases).
4. A more detailed derivation is given in J. M. Prausnitz, *Molecular Thermodynamics of Fluid-Phase Equilibria* (Prentice-Hall, Englewood Cliffs, N.J., 1969), chap. 8.
5. K. Denbigh, *The Principles of Chemical Equilibrium* (Cambridge Univ. Press, London, ed. 2, 1966).
6. F. C. Andrews, *Science* **178**, 1199 (1972).
7. Supported by National Science Foundation.

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## Cell Repository

The National Institute of General Medical Sciences (NIGMS) has been supporting a research program on genetics with special emphasis on genetic disease, and has now awarded a contract to the Institute for Medical Research, Camden, New Jersey, to establish and operate a repository of genetic mutant cell cultures and normal control cultures stored in liquid nitrogen to facilitate and support expanded clinical and basic research programs in this field.

A scientific advisory committee (F. H. Ruddle, chairman; R. Krooth; S. Gartler; K. Hirschhorn; W. Mellman; E. Neufeld; and G. Sato) has been instrumental in coordinating the development and research aspects of the repository. The committee will have the functions of (i) recommending matters of general policy and (ii) recommending specific policies, such as the inclusion of particular cell lines or classes of cells.

The repository will contain viable cells in low passage with single and multiple gene defects, both defined and undefined at the molecular level; chromosome abnormalities (translocations, deletions, and others); polymorphisms (isozymes, antigens) plus carrier and normal control cultures. Most lines will be of human origin, but a limited number of nonhuman mammalian lines with unique or valuable genetic characteristics may be accepted.

The initial phase of this program is to establish cell cultures from patients in which the genetic abnormalities have been confirmed. Additions to the collection can be in the form of low passage cell cultures, or, preferably, skin biopsies from patients with confirmed genetic variant diseases. Initiating cell cultures from biopsies assures preservation in low passage to provide confidence that they will retain the in vivo karyotype, metabolic, and enzyme characteristics and, at the same time, have maximum life-span in culture and minimum opportunity to become contaminated during passage. All cultures are grown without antibiotics after primary culture, and stored in liquid nitrogen. Minimum criteria of cell cultures accepted in the repository will be freedom from contamination with bacteria, fungi, and mycoplasma; species of origin; karyotype; and specialized assays when applicable.

Although the emphasis during the first year will be on fibroblast cultures, the repository will accept lymphocyte and amnion cultures for storage. The advisory committee is now evaluating a number of technical problems such as biohazard regulations and clinical usefulness before suggesting the procedures to be followed in storing and shipping lymphocyte cultures.

The advantage of a central repository of mutant and normal cell cultures for genetic and biochemical studies are:

1) The study of cells from a number of persons with the same inherited disorder may reveal subtle variations in the underlying defect that would be important to its diagnosis and treatment.

2) Use of identical cell lines for study in different laboratories should facilitate the comparison of data and interpretation of research results.

3) Cell lines from some rare diseases otherwise would not be readily available to all interested investigators.

4) Investigators in different laboratories can develop and maintain numerous cell lines.

5) The availability of the skills for characterization and identification of genetic mutant cells will assure uniformity and reliability of cells from the repository.

Interested investigators are invited to utilize the repository as a source of genetic mutant cell cultures. A moderate fee will be charged plus shipping costs.

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