et al. cited this reference to indicate that this random network model, which is an aggregate of atoms with a total diameter of only about 18 Å, produced an RDF with significant detail out to 12 Å. Examination of this reference shows that no RDF is displayed and no mention is made of any distances beyond the first Si–Si distance (~ 3.1 Å). We are, however, familiar with an article by Evans and King (*4*) that is not mentioned in the technical comment by Evans *et al.* This work (*4*) does display the RDF calculated from their model. Evans and King state (*4*) that, for their model RDF, "significant information regarding coordination is being obtained from the geometrical centre of the model out to at least 9 Å and the model density is essentially continuous, with statistical fluctuations, between 12 and 18 Å." There is little similarity between this model and our experimental results beyond 7 Å. Evans and King (*4*) state that "we would be grateful for accurate experimental data that can be compared with computations made from the model coordinates."

In the first paragraph of their technical comment, Evans *et al.* have only partially quoted the pertinent concepts contained in the early research on the structure of glass, and the part that is omitted is quite significant to this discussion. They imply that early workers in the field were aware of experimental results such as ours and with resulting implications concerning glass structure. They quote from (*5*): "On the random network hypothesis it is postulated that the atoms are bound together in the same way as in the crystalline forms of silica, but forming a continuous noncrystalline network." Let us continue this quote for three more sentences: "Each silicon is tetrahedrally surrounded by 4 oxygens, and each oxygen shared between two tetrahedral groups. Each tetrahedral group has 4 nearest neighbors at 3.1 Å, and 12 next nearest neighbors at 5.0 Å. Beyond this the distances are indefinite." It is evident that an RDF with detail out to 5 Å is quite different from one with ordering out to 20 Å (or even 12 Å). It should be further emphasized that the early investigators cited (*5, 6*) considered the similarity between crystals and glasses to be limited to the shortest interactions such as bonded distances and next nearest neighbors.

There is one further comment. Evans *et al.* introduce the term "crystallite" in describing the ordered regions which are implied by our experimental results. We find the term crystallite to be unsuitable, since it implies that periodic ordering is to be expected which extends over at least several unit cells. The type of ordering that we have observed seldom, if ever, extends in any one region over the length of even a single unit cell of tridymite. It may be useful to consider the construction of a random network, not in the usual sense by beginning with the tetrahedron as the basic unit, but by starting with various groups of atoms up to 20 Å in dimension with the bonding topologies found in the tridymite structure. These larger groupings would then be attached to one another in an efficient, noncrystalline manner.

In response to the question raised by Evans *et al.* concerning keatite, we have considered the crystalline polymorph keatite and found its associated RDF incompatible with those of silica and germania glasses. Details concerning the reliability of our experimental results will be contained in a forthcoming article on the procedures of data reduction and error analysis (*7*). We urge the interested reader to consult the cited literature.

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Waste Paper Used for the Cleanup of Oil Spills

Oil may be removed from a body of water by dispersing over the oil layer fiberized paper falling within a specific fragment size range. The fiberized paper sorbs (*1*) or collects in excess of 27 times its weight in oil and is capable of holding the oil on the water surface as an oil–fibrous paper matrix or agglomerate for extensive periods so that it can be easily skimmed and recovered. Oil can be expressed from the oil-paper mass, and the paper mass can be refiberized and reused repeatedly to sorb or collect additional oil.

Paper materials which can be used include newspaper, cardboard, waterproof paper fiber containers, and wastepaper. The paper is fiberized, by means of a commercial type of hammer mill, to a size ranging from 0.01 to 0.1 mm in diameter and from 0.75 to 10.0 mm in length.

The most critical element of the process is fragment size and geometry. Laboratory experiments have been carried out with three separate samples of paper from the same source but of different fragment size. When shredded to approximately 1 mm in diameter and 8 to 23 cm in length, the paper collected twice its weight in oil; ball-milled paper having a maximum dimension of not more than 0.05 mm sorbed approximately its equivalent weight in oil; fiberized paper ranging from 0.01 to 0.05 mm in diameter and 0.75 to 2.0 mm in length sorbed approximately 28 times its weight in oil.

In the patent literature (*2*) are descriptions of a number of sorbent materials that have been used to sink oil or to immobilize it on the water surface. Straw, sawdust, and clay sorb only relatively small quantities of oil. Some of these materials will sorb water as or more readily than oil. Fiberized paper is much more oleophilic than hydrophilic. After the first use the expressed paper will be hydrophobic as well as oleophilic. At this point it could be refiberized and used for collecting oil that has washed up on the beaches or it could be spread on the beaches before the oil slick reached the shore. The oil-recovery system using fiberized paper has been tested in a small lagoon with a man-made oil spill and found successful. Larger scale tests are planned.

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Notes

1. The expression "sorb" or "sorbent" is used to refer to the quality or property of taking up and holding a substance whether by adsorption, absorption, or physical entrapment in a fiber matrix.
2. U.S. Patent Nos. 3,681,237, 3,676,357, and 3,674,683.

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