atoms. When these atoms strike alkaline earths such as oxides of magnesium or calcium, or alkaline metals such as sodium or potassium, they can unite to form superoxides which readily release oxygen upon exposure to water vapor. Less oxygen was released in the GEx instrument at the more northerly lander 2 site, says Oyama, because the greater amount of water vapor in the ambient atmosphere had already set it free. The same instrument detected nitrogen, CO and argon—evidence of the desorption of gases physically affixed to the surfaces of the soil grains—but even at lander 2, according to Oyama, there was at least 700 times more oxygen detected in the instrument than could be accounted for by desorption alone. The bulk of the oxygen, he reasons, must then have come from a deeper source, chemically bound to the interior of the soil grains—in other words, from the $Ca(O_2)_2$ and other superoxides.

For the other phase of his theory, Oyama was inspired by thinking not of inanimate rocks but of human beings. When hydrogen peroxide (H_2O_2), commonly used as a disinfectant, is applied to a human wound, it bubbles. This, says Oyama, is due to the iron in the enzyme catalase, which combines catalytically with the H_2O_2 to release bubbles of oxygen. A similar catalytic reaction, he believes, is at work on Mars.

Viking's third biology experiment uses a "labeled-release" instrument that looks for labeled gases given off by soil exposed to a labeled nutrient. The positive indications reported by the instrument presumably represent oxygen that is released from some source and combined with the labeled carbon into $^{14}CO_2$. In Oyama's scenario, hydrogen peroxide formed photochemically in the atmosphere reacts with a catalyst on the soil-grain surfaces to release oxygen that diffuses into the grains, reacting with the alkaline earths and metals to form other superoxides inside. Atmospheric water vapor readily converts the superoxides into *per*oxides, which in turn combines with water in the nutrient to form H_2O_2 that oxidizes the labeled components of the nutrient to release the labeled CO_2.

Comparing the effectiveness and likelihood of formation of various catalysts under Martian conditions, Oyama concludes that the one eligible candidate is a form of iron oxide known as gamma Fe_2O_3 or maghemite. On earth, he says, maghemite is usually found only around the edges of hydrothermal or magmatic activity, since it represents a rather specific temperature transition between about 300°C and 400°C. The abundance of water on earth has converted much of this material into a noncatalytic form, but on Mars, says Oyama, the maghemite has been able to survive virtually unchanged since its formation in what he believes to have been a major episode of volcanic and/or impact heating early in the planet's history. The many signs of apparent water activity seen in Viking's photos, he says, simply suggest that the heating episode occurred after the water was gone.

Oyama's theory will have to stand the test of time, additional data and competing theories. But it does show that looking for life on other worlds has the potential for making valuable contributions in other fields as well. □

Carter revises the science budget

The Carter administration got its first say in science policy matters last week when it published its revisions of the 1978 budget. As incoming President, Carter is given an opportunity to alter the budget of his predecessor before the Congress begins its own decisions on spending. Carter changed little of Ford's authorizations for basic science research. But in the area of energy, Carter made significant changes, emphasizing short-term goals while backing away from distant long-term projects not realizable by the next decade. From breeder reactor projects, Carter cut $199 million, and an additional $80 million was cut from the fusion research budget. At the same time, Carter added $42 million for research on oil and gas recovery and coal conversion techniques.

Of the $80 million cut from Ford's original authorizations for fusion research, $60 million came from magnetic fusion projects. The tokamak fusion project at Princeton lost $20 million, enough to delay completion of the project by six months. The mirror fusion project at Lawrence Livermore was cut $10 million and the 14-MeV Intense Neutron Source at Los Alamos lost all of its $10 million, completely canceling that work. An additional $20 million in operating costs for magnetic fusion was cut across the board. Finally, some five labs lost funds totaling $20 million for laser fusion research.

The single largest cut from the budget for the liquid fast metal breeder reactor came from the Clinch River project in Tennessee, which lost $84.8 million. Officials at ERDA said the loss in funding would set back the criticality date from October 1983 to June 1984. The remainder of $199 million cut from breeder research came from test facilities, fuels and the large plant's design prototype.

While fusion and breeder reactor research did not appear to the new administration to offer quick payoffs, at least in the next decade, the administration regarded fossil fuel research differently. Carter increased funding for more second- and third-generation coal conversion techniques, efforts to improve their efficiency and economic feasibility. New techniques in oil and gas recovery were also emphasized by Carter. Some of this research will concentrate on new polymer field flooding technologies. In addition, Carter increased by $1.8 billion authority for the petroleum storage program. Energy conservation, too, was increased $244 million in 1978 over Ford's request, $160 million of that intended for R&D.

Funding for the National Science Foundation was kept at the same level, despite the hope by some that Carter would increase funds for basic science. Many were pleasantly surprised by the addition of $15 million to the NASA budget. The first $10 million was earmarked for an evaluation and analysis of a future mission to Mars by the 1984 launch opportunity. Included in the evaluation would be a look into the possibility of using rover technology for a new Mars lander and a surface sample return vehicle, as well as studies of new scientific instrumentation.

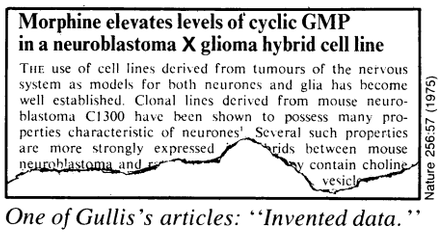
The other $5 million of the NASA budget increase was for a back-up spacecraft for the Landsat D earth resources satellite.

Besides the new administration's efforts to emphasize short-term, quickly realizable goals in energy research, the revised budget also stressed fiscal austerity. Now, the budget goes to the appropriate committees in the Congress where it will be debated, drafted and redrafted for the next six months. □

Researcher admits he faked journal data

A remarkable case of a scientist intentionally falsifying research results is announced in a statement by the man's colleagues in the Feb. 24 NATURE together with a candid admission from the scientist that data in published papers he coauthored "are mere figments of my imagination." The admission totally invalidates the research results in three scientific papers in an important area of biological research dealing with levels of cyclic GMP in neuroblastoma cells and hybrid cells. Data on cyclic AMP in a fourth paper were also falsified. Two of the papers had been published in NATURE.

The new case recalls several other episodes in recent years of faked research results, the most notorious of which was the Summerlin incident with "patchwork mice" (SN: 6/1/74, p. 348). This one differs from earlier cases in that both the accusation and the admission have been


Morphine elevates levels of cyclic GMP in a neuroblastoma X glioma hybrid cell line

THE use of cell lines derived from tumours of the nervous system as models for both neurones and glia has become well established. Clonal lines derived from mouse neuroblastoma C1300 have been shown to possess many properties characteristic of neurones'. Several such properties are more strongly expressed in [illegible] hybrids between mouse neuroblastoma and [illegible] may contain choline [illegible] vesicle

Nature 256:57 (1975)

One of Gullis's articles: "Invented data."