Letters

Penguins Oiled in Argentina

Oily ballast water dumped from oil tankers appears to be a major source of mortality for seabirds along the Argentine coast. At Punta Tombo, Argentina (44°02′S, 65°11′W), in March 1982, more than 390 oil-covered Magellanic penguins (*Spheniscus magellanicus*) came ashore and died. At Punta Tombo from September 1983 through 1986, hundreds of penguins were found covered with oil. During incubation in September and October 1986, significant numbers of heavily oiled birds were observed at Punta Tombo, including one pair whose eggs became covered with oil from contact with the incubating parent and did not hatch. The latest oil spill from ballast water was detected on 11 February 1987, when oil washed ashore at Cabo Dos Bahias, Argentina (44°55′S, 65°31′W). In this case, as in previous events, a tanker was seen about 10 kilometers from shore, and 4 days later oil stains on beaches and oil sheens in tide pools appeared. Oil continued to build up on beaches, reaching its highest concentration on 13 February 1987.

Discharge of oil is becoming more common. To quantify its effect on Magellanic penguins at Cabo Dos Bahias, we surveyed the two main beaches penguins use to enter the rookery for oiled birds at 17:45 on 13 February 1987. There were 2556 Magellanic penguins standing along the shore, most (~75 percent) of them molting. Of the 823 adults, 24 had spots of oil on their head or front. Two other adults had a sheen of oil over all their feathers. Nearly all of the 1733 juveniles (~95 percent) were in various stages of molt, and 66 had oil spots on their feathers. Between one-fourth and one-half of the surface area of four other juveniles was covered with oil. We saw one chick that had an oil sheen. Because birds were standing close together and many had their backs to us, we could completely see only about one-third of the 2556 birds counted. Thus, although direct counts showed 3 percent of the adults and 4 percent of the juveniles with oil, the figure should be adjusted for our ability to see the birds. Thus, approximately 9 percent of the adults and 12 percent of the juvenile penguins were oiled.

Even small amounts of oil on penguins compromise their insulation, increase energy needs, and if ingested, can cause physiological damage. Oiled birds often die. The technology to remove oil from water has existed since the 1930s. Because it is cheaper to dump oil-contaminated ballast water into the ocean, most tankers still dump untreated waste water. The cost to wildlife worldwide is probably much greater than previously thought, and policies to prohibit dumping should be instituted.

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R&D Expenditures in the Petroleum Industry

The sharp decline in crude oil prices during 1986 has elicited concern that research and development (R&D) expenditures by the petroleum industry would be curtailed so substantially that future oil and gas recovery will be adversely affected. John Walsh's article "Oil industry R&D takes a fall" (News & Comment, 27 June 1986, p. 1593) traced the decline in petroleum industry R&D to the beginning of the 1980s. According to Walsh, R&D activity "within the petroleum industry has been cut by at least 30 to 40 percent in the last 3 years."

Walsh's commentary was based on very limited, ad hoc data. A more systematic source of R&D data in the petroleum industry indicates that these apparent trends were not evident through 1985 (the most recent year for which data are available). The Financial Reporting System (FRS) of the Energy Information Administration collects detailed financial and operating data, including R&D expenditures, from 22 of the largest domestic energy producers (*1*). These data indicate that petroleum-related R&D expenditures, particularly those associated with oil and gas recovery, remained quite stable from 1981 through 1985.

Contrary to the impression given by Walsh, R&D expenditures of the major energy producers rose by more than 1 percent in 1985 over the 1984 level (*2*, p. 84). While R&D sponsored by the federal government dropped by almost 15 percent from 1984, this source of funds only accounted for 2.2 percent of the total R&D expenditures in 1985, down from 3.1 percent in 1981 (Table 1). Internal company sources of R&D funds rose 1.4 percent in 1985 and accounted for 97.3 percent of total R&D spending.

Table 2 indicates the distribution of the energy and nonenergy R&D funds from 1981 through 1985. Nonenergy R&D spending rose 2.5 percent in 1985 and has been larger than total energy R&D spending since 1983; this is partly because of the presence in the database of Du Pont, whose prime business activity is in related nonen-

Table 1. Sources and distribution of R&D funds for major energy producers (*3*). Numbers in parentheses indicate distribution among sources (%).

Sources	Millions of dollars					Change (%) 1984–1985
	1981	1982	1983	1984	1985	
Internal company	3338.1 (95.7)	3719.7 (96.0)	3691.8 (96.8)	3945.0 (97.1)	3998.9 (97.3)	1.4
Federal government	108.3 (3.1)	104.1 (2.7)	93.1 (2.5)	104.2 (2.6)	88.8 (2.2)	−14.8
Other	40.6 (1.2)	50.3 (1.3)	27.4 (0.7)	14.6 (0.3)	19.8 (0.5)	35.8
Total	3487.0	3874.1	3812.3	4063.8	4107.5	1.1

Table 2. Worldwide R&D expenditures by major energy producers (*3*). Sum of components may not equal total because of independent rounding.

Uses of funds	Millions of dollars					Change (%) 1984–1985
	1981	1982	1983	1984	1985	
Petroleum total	1136.2	1247.2	1243.3	1306.8	1337.6	2.4
Oil and gas recovery	668.0	751.8	756.3	692.4	801.4	15.7
Other petroleum	468.1	495.3	487.1	614.4	536.2	−12.7
Nonpetroleum energy total	609.3	631.9	510.0	505.6	433.7	−14.2
Synthetic fuels	420.9	379.6	280.8	235.4	217.5	−7.6
Renewable energy	52.4	53.9	53.2	54.5	78.3	43.7
Other energy	136.0	198.4	176.1	215.7	137.8	−36.1
Total energy	1745.4	1879.1	1753.3	1812.5	1771.3	−2.3
Nonenergy total	1625.2	1839.4	1970.7	2157.3	2211.6	2.5
Unassigned	116.4	155.6	88.3	94.0	124.7	32.7
Total R&D	3487.0	3874.1	3812.3	4063.8	4107.5	1.1

ergy areas (especially petrochemicals). However, many of the major energy producers have diversified into several nonenergy areas this decade, and not always with favorable results. Total energy R&D expenditures actually declined in 1985 by 2.3 percent, but have fluctuated since 1981.

More encouraging patterns can be seen in petroleum R&D funding, which was up 2.4 percent in 1985 and has risen every year but one since 1981. Most of this spending has gone to enhanced oil and gas recovery techniques, such as steam and CO_2 injection. While such expenditures rose a healthy 15.7 percent in 1985, R&D spending in the "other petroleum" category (for example, refining) dropped by 12.7 percent.

A different picture can be observed in nonconventional energy categories. R&D spending on synthetic fuels fell by 7.6 percent in 1985, mostly due to large declines in expenditures on oil shale projects. However, expenditures on coal gasification–liquefaction and tar sands actually rose in 1985. Renewable energy sources continued to fare well in 1985, in sharp contrast to recent trends in federal funding. Spending on solar energy, geothermal energy, and other renewable energy R&D projects rose by 43.7 percent in 1985. Finally, expenditures on "other energy" R&D, mostly conventional coal and nuclear energy projects, plummeted by 36.1 percent in 1985.

These data do not support the statement that the petroleum industry R&D activity declined sharply in the period from 1981 through 1985. Expenditures for the larger categories of activities, with the exception of synthetic fuels development, were stable or increasing in this period. Unfortunately, the data for R&D funding in 1986 are not yet available. Currently available data for the major energy producers in the United States indicate that there has been no precipitous fall in R&D activity, particularly for oil and gas recovery.

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REFERENCES AND NOTES

1. When the FRS began in 1976, there were 26 reporting companies: Amerada Hess Corp., American Petrofina, Inc., Ashland Oil, Inc., Atlantic Richfield Co., Burlington Northern, Inc., Chevron Corp. (formerly Standard Oil of California), Cities Service Oil Co., Coastal Corp., E.I. du Pont de Nemours and Co. (Du Pont), Exxon Corp., Getty Oil Co., Gulf Oil Corp., Kerr-McGee Corp., Mobil Corp., Occidental Petroleum Corp., Phillips Petroleum Co., Shell Oil Co., Standard Oil Co. (an Indiana Corp.), Standard Oil Co. (an Ohio Corp.), Sun Company, Inc., Superior Oil Co., Tenneco Inc., Texaco Inc., Unocal Corp. (formerly Union Oil of California), Union Pacific Corp., and United States Steel Corp. Subsequent mergers between companies in 1982 and 1984 reduced the reporting companies to 22; Standard Oil of Indiana has changed its name to Amoco, while United States Steel Corp. is now known as USX.
2. *Performance Profiles of Major Energy Producers 1985* (DOE/EIA-0206, Energy Information Administration, Washington, DC, January 1987), p. 84.
3. *Ibid.* (1981–1985).

Locust Travel

I read the article "Going with the wind" (News & Comment, 3 Oct. 1986, p. 18) concerning locusts. On the evening of 28 November 1979 and on the morning of 29 November a much publicized "fallout" of dust occurred in Ireland. In a meteorological analysis of this fallout (*1*), I showed how the dust had probably been lifted by unstable dust-storm activity in the North African desert and advected to Ireland, where some of it was washed down by rain.

A live desert locust (*Schistocerca gregaria–Sorskål*) was found near Cork on the morning of that "fallout." It was kept alive at the Zoological Department of University College, Cork, for some time and is now preserved there. It is not too farfetched to presume that this locust, like those mentioned in the article that "[wound] up in Scotland," made the same journey as the dust and may, incidentally, have survived subzero temperatures on route.

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REFERENCES

1. C. O'Connor, "Internal memorandum 93/80" (Irish Meteorological Service, Dublin, 1980).

International Archaeological Congresses

Much has been made of the "great success" that attended the breakaway "World Archaeological Congress" held at Southampton in September 1986. According to information one of us has received from the chairman of that meeting, "over 1000 people registered from about 100 countries."

We feel it is important to place these figures in perspective. The attendance of 1000 contrasted sharply with the 2000 to 3000 which the organizers originally expected. Moreover, we would remind our colleagues that at the 9th Congress of the International Union of Prehistoric and Protohistoric Sciences (IUPPS), held at Nice from 13 to 18 September 1976, which, in accordance with the constitution of IUPPS, was open to scientists from all countries, 3127 participants from 94 countries were present.

So, at the price of holding a meeting by sacrificing a major principle, the organizers gained five or six countries, lost 2000 participants and did grievous harm to British and world archaeology. Add to that the unprecendented split in British and world archaeology, the wedge driven between colleague and colleague, the stimulus given to a major cleavage and politicization of world science . . . and we cannot see that all this adds up to "a great success."

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Erratum: In Colin Norman's article "The dark side of SDI" (News & Comment, 27 Feb., p. 962), the affiliation of Caroline Herzenberg was incorrectly given as Brookhaven National Laboratory. She is a member of the staff of Argonne National Laboratory. The paper she presented at the AAAS symposium in Chicago on 15 February was based on research conducted independently, and not with laboratory funding.

Correction

In Deborah M. Barnes' article "AIDS commission bills proliferate" (News & Comment, 6 Mar., p. 1136), the AIDS commission proposals introduced by Senator Ted Stevens (R–AK) and Representative Jerry Lewis (R–CA) were incorrectly identified as being "along the lines of [those] recommended by the Institute of Medicine in its report ("Confronting AIDS") last fall." Instead, the IOM recommended the "establishment of a presidential or joint presidential and congressional commission that is independent and able to provide an ongoing critical assessment of needs—involving basic and clinical research, health care, public health, and other societal issues—as the AIDS epidemic develops," according to Roy Widdus, director of the IOM Division of International Health.

The congressional advisory panel on AIDS, described in a bill introduced by Senator Pete Wilson (R–CA), incorrectly identified its potential membership. It would be open to IOM members, not exclude them, as the article indicates.