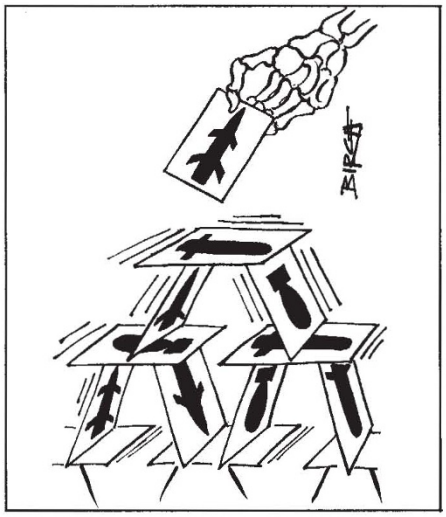
US nuclear arsenal

Eight new warheads a day

Washington

MORE than 700 US combat units — over 100,000 troops — are "certified" in the use of nuclear weapons, according to a compendium of US nuclear forces published last week by the Natural Resources Defense Council (NRDC)*. The book, a sort of illustrated catalogue of the US arsenal, offers an unusually complete picture of the full array of tactical and strategic weapons maintained by the



United States and of how deeply integrated they are into the US fighting forces. All four military branches — plus the Reserves and National Guard — are trained to use nuclear weapons. Approximately one-half of the 26,000 warheads in the US stockpile are designed for use in battle-field weapons, including antisubmarine and anti-aircraft rockets, air-to-air missiles, artillery shells and even land mines.

Neither the Department of Defense nor the Department of Energy (which has responsibility for production of nuclear warheads) would comment on the accuracy of the data in the book, which was compiled from open sources, including congressional testimony and data obtained under Freedom of Information Act requests. The Department of Energy, however, did advise the authors that publication of the book would be damaging to "the national interest", although it stopped short of taking any legal action to halt publication or distribution.

Some of the most interesting data in the book deal with tactical weapons, which, as co-author Milton Hoenig notes, are not covered even under the stalled SALT and Intermediate Nuclear Forces negotiations. The United States has deployed 5,000 nuclear artillery shells, mostly in Europe, as well as surface-to-surface guided missiles, anti-aircraft missiles, and two varieties of nuclear land mines, known as "Atomic Demolition Munitions" (ADMs). The smaller of these ADMs weighs about 60 pounds and is intended for use by commandos against targets behind enemy lines. It has an explosive yield of as little as 10 tonnes (TNT equivalent). A test of an ADM at the Nevada Test Site in 1955 nonetheless produced a crater 400 feet across and 60 feet deep. Three artillery warheads, for 155-mm and 203-mm guns, are in use, including "enhanced radiation" devices.

The Navy maintains the greatest variety of short-range nuclear arms: ship-launched and submarine-launched antisubmarine rockets, anti-aircraft missiles and surface-to-surface missiles. The Navy is also developing a new air-to-air missile, the Phoenix, to be carried by carrier-based long-range interceptor planes.

The book also provides data on nuclear weapons production, which is now proceeding at the pace of eight new warheads per day; taking into account the warheads retired from service, the result is still a net gain of three per day. According to the book's authors, the US stockpile will grow by 13 per cent over the next five years; by the mid-1990s the arsenal will be approaching the previous peak of 32,000 warheads (reached in 1967) and will in addition have been thoroughly modernized, most warheads having been replaced by new, higher-yield versions.

Future volumes from NRDC will deal with the Soviet nuclear arsenal, arms control and nuclear strategy.

Stephen Budiansky

**Nuclear Weapons Data Book* by T. B. Cochran, W.M. Arkin and M.M. Hoenig (Ballinger, Cambridge, Massachusetts, 1984; $19.95).

Nuclear reprocessing

West Germany plans ahead

THE West German Federal Ministry of the Interior last week reaffirmed its support for the construction of a reprocessing plant for nuclear waste, in particular "to secure national independence in this area".

The organization responsible is the *Deutsche Gesellschaft für Wiederaufbereitung von Kernbrennstoffe* (DWK) which was formed jointly by the 12 electricity companies concerned. The proposed undertaking will be financed by DWK and will receive no money from the federal ministry.

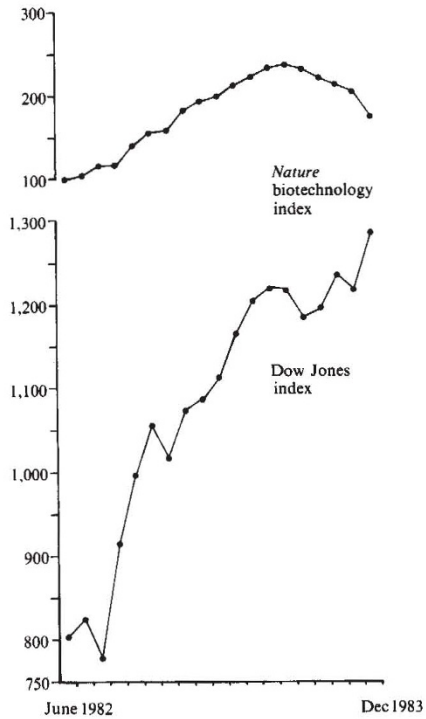
Approval procedures are now under way for two sites: Dragahn in Nieder-Sachsen, not far from the Gorleben underground storage area, and Wackersdorf, Schwandorf in Bavaria. The procedures should end late this year, when DWK will decide which site it wants. Only final approval by the *Länder* ministries will then be necessary before building starts.

The plan is to build a single installation capable of processing an average of 350 tonnes of spent rods per year, beginning in 1986 and coming into service slowly from 1993 at a rate of 50 tonnes and working up to a final 450 tonnes annually. More than 500 tonnes would overstep environmental control limits.

Meanwhile, the question of costs is causing concern. Electricity from nuclear installations, although it is now cheaper than that from coal-fired stations, already carries a small surcharge to the eventual cost of reprocessing. The revenues collected will accumulate in a fund for the construction of the reprocessing plant. While the cost of the plant is currently given as DM4,300 million (£1,100 million), it could easily rise to DM6,000 million or DM8,000 million before completion, with annual running costs of DM1,000 million. "A reprocessing plant is not an economic proposition", the industry's union spokesman asserted, but nevertheless supported the project as a demonstration of industrial expertise.

Sarah Tooze

The falling index



***NATURE*'s monthly biotechnology index tumbled another 21 points in December 1983 (see 12 January, p.102), falling to 175 against the peak of 238 in July 1983. The index started at 100 in June 1982. During the same period, the overall value of shares on the US stock markets, as represented by the Dow Jones index, has risen dramatically (see graph). Moreover, the decline has been spread across the biotechnology board, affecting 15 of the 16 shares from which the index is compiled.** □

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