

During the period of Diamox development and early use, other firms, most notably Merck Sharp & Dohme, had undertaken research programs of their own aimed at finding sulfonamides that offered diuretic properties. Actually, the Merck program had begun in 1943, as a basic research effort to learn more about the kidney. After 12 years of investigation the firm discovered chlorothiazide; following three additional years of trial, the product was introduced for physician prescribing in 1957 as Diuril.

Diuril's success was almost immediate—by 1958, it accounted for 72 percent of diuretic prescriptions, while Diamox dropped to only 17 percent. In the years since then, Lederle has been unsuccessful in finding a product capable of recapturing the share of the diuretic market its Diamox once held. Indeed, by 1965, the Diamox share had fallen to less than 4 percent of the diuretic market. Diamox has continued to enjoy favor for use in treatment of various conditions, primarily because of its value in controlling the intraocular pressure found in glaucoma; it also has proven useful in certain forms of epilepsy. Its earlier significant share of diuretic prescriptions was lost to Diuril and the several other thiazide products introduced by various firms since 1958.

As mentioned above, financial data on Lederle Laboratories, a division of American Cyanamid Co. are not published separately.

*Merck-Cortisone.*—The experience of Merck & Co. with cortisone provides another outstanding example of how costly research, resulting in a major scientific breakthrough, may be followed by displacement by a competing product; causing the loss of expected financial rewards. The story is described in full detail in the 1959 hearings before the Senate Subcommittee on Antitrust and Monopoly (Part 14, p. 8013ff). Merck's interest in steroid chemistry dates from 1933. Its synthesis of cortisone, whose usefulness in rheumatoid arthritis was first demonstrated in the fall of 1948, merits the word "breakthrough."

In 1949, Merck felt that the demands of large-scale production were too difficult for one company to try to meet the public need for so major a new product. Its Board of Directors adopted a statement of policy designed "to make cortisone and other related drugs available to the public as quickly as possible in necessary quantities and at reasonable prices." To that end, Merck made it possible for its competitors to enter the cortisone market, and many firms did so. In addition, a number of firms, including Merck, undertook major competitive research programs to find steroids better than cortisone. The competition was extensive and successful.

The results of these events clearly were beneficial to patients. Major corticosteroid price reductions took place, and major steroid innovations were introduced. As for Merck: within a few years its share of the cortisone market was virtually cut in half.

In the next few years Schering introduced prednisone and other firms, among them Squibb, Upjohn and Lederle, entered the market in the prednisone family, triamcinolone, and other cortisone-related agents. Even though Merck brought out its own versions of prednisone and prednisolone, it nevertheless wound up in 1958—a decade after it had virtually created the steroid drug market—with only 17 percent of that market. The decline was even more dramatic in terms of corticosteroid plain tablets. Merck's brand of cortisone, the original steroid, dropped from 100 percent of all new steroid prescriptions written in 1950 to 3 percent in 1956 and to less than 1 percent in 1958.

It is difficult to lay changes in profit rates for a firm as diverse as Merck on the doorstep of any single product class; nevertheless, it is clear that cortisone reverses contributed to the drop in Merck profits in the early 1950's. Whereas the company had been enjoying profits on sales in the area of 10½ percent since the war, it realized only 7.9 percent in 1952 and declined further to 7.4 percent in 1953.

It would be misleading to suggest that this decline in earnings was attributable solely to the cortisone experience. In fact, other factors were involved, including drops in antibiotic and other prices. But it seems clear that the displacement of Merck corticosteroids after such an expensive research effort was an important contributing factor in the loss of earnings.

As is well known, this particular company has one of the most enviable research records of any in the world. During the middle fifties and thereafter, it continued to expand an already broad commitment of medical research, despite the competitive "squeeze." Unquestionably, Merck's introduction later in that decade of significant new products helped the company regain and improve upon its former profit position.