in ulcerative plaques ([9]); whereas in downgrading reaction, the afore-mentioned features may affect almost all of the existing lesions. In addition, the expansion of the existing plaques and the appearance of fresh lesions ([9, 11]) is contributory. These changes may be attended by pyrexia. Type 1 (lepra) reaction may be recorded in borderline tuberculoid (BT), borderline borderline (BB), and borderline lepromatous (BL) leprosy. Furthermore, intercurrent infections, pregnancy and drugs may precipitate these episodes ([9, 11]). Type 1 (lepra) reaction, therefore, should be considered as a mirror image of the ameliorating or deteriorating cell-mediated immunity ([8, 10, 11, 13]). Histopathology and immunology may be complementary to clinical impression and are depicted in Table 1 ([7, 11]).

At this juncture, it is relevant to highlight the clinical as well as histopathological features of downgrading reaction, and downgrading per se ([9]). The latter phenomenon is a part of the natural evolution of the disease, and is envisaged in the continuous spectrum of leprosy (Table 2).

The term "relapse in leprosy" should preferably be replaced by "reactivation leprosy," a self-explanatory term, in order to avoid confusion. Nevertheless, the relapse/reactivation leprosy should be recognized by the criteria laid down afresh in an abridged form (Table 3). This was considered imperative for few of the parameters appeared superfluous ([4]).

—Virendra N. Sehgal, M.D., F.N.A.Sc.
Sambit N. Bhattacharya, M.B.B.S.
Sanjiv Jain, M.B.B.S.

Department of Dermatology,
Leprology and Venereology
Maulana Azad Medical College
and associated LNJPN
and GB Pant Hospitals
New Delhi 110002, India

REFERENCES

1. Bjune, G. Reactions in leprosy. Lepr. Rev. **54** Special Issue (1983) S61–S67.
2. Jopling, W. H. Reactional states. In: *Handbook of Leprosy*. London: William Heinemann Medical Books, 1984, pp. 68–77.
3. Katoch, K., Ramanathan, U., Natrajan, M., Bagga, A. K., Bhatia, A. S., Saxena, R. K. and Ramu, G. Relapses in paucibacillary patients after treatment with short term regimens containing rifampin. Int. J. Lepr. **57** (1989) 458–464.
4. Pannikar, V., Jesudasan, K., Vijaykumaran, P. and Christian, M. Relapse or late reversal reaction? Int. J. Lepr. **57** (1989) 526–528.
5. Pavithran, K. Relapse of paucibacillary leprosy after short course multidrug therapy. Indian J. Lepr. **60** (1988) 225–229.
6. Ridley, D. S. and Radia, K. B. The histological course of reactions in borderline leprosy and their outcome. Int. J. Lepr. **49** (1981) 383–392.
7. Sehgal, V. N., Koranne, R. V. and Beohar, P. C. The histopathology of type I (Lepra) and type II (ENL) reactions in leprosy. Indian J. Lepr. **58** (1986) 240–243.
8. Sehgal, V. N., Gautam, R. K. and Sharma, V. K. Immunoprofile of reactions in leprosy. Int. J. Dermatol. **25** (1986) 240–244.
9. Sehgal, V. N. Reactions in leprosy; clinical aspects. Int. J. Dermatol. **26** (1987) 278–285.
10. Sehgal, V. N., Srivastava, G. and Sundharam, J. A. Immunology of reactions in leprosy; current status. Int. J. Dermatol. **27** (1988) 157–161.
11. Sehgal, V. N. and Sharma, V. Reactions in leprosy—a prospective study of clinical, bacteriological, immunological and histopathological parameters in thirty-five Indians. J. Dermatol. (Tokyo) **15** (1988) 412–419.
12. Touw Langendijk, E. M. J. and Naafs, B. Relapses in leprosy after release from control. Lepr. Rev. **50** (1979) 123–127.
13. Waters, M. F. R., Turk, J. L. and Wemambu, S. N. C. Mechanism of reactions in leprosy. Int. J. Lepr. **39** (1971) 417–428.

Dr. Pannikar Replies

To the Editor:

I am very grateful to Professor Sehgal for his very valuable comments. He has added new dimensions to this issue, such as differentiation between upgrading and downgrading reactions, downgrading reaction and downgrading per se and relapse or type 1 reaction (refer to Tables 1, 2, 3).

I still feel that clinically it is difficult to differentiate between relapse and late reversal reaction, especially under field conditions. It is important to find simple tools to differentiate these two phenomena because management of these two is different. I suggest that under field conditions both of these phenomena should be given a "therapeutic trial" with steroids and, depending on the response, may be categorized into two groups: the group responding favorably to steroids—reversal reaction; the group not showing any response—relapse. In my paper, I have already emphasized the need for a controlled, prospective multicentric study to elucidate these differences.

I once again thank Professor Sehgal for his comment.

—V. K. Pannikar, M.B.B.S., M.Sc.(Lond.)

Ag. Head
Epidemiology and Leprosy Control
Schieffelin Leprosy Research
& Training Centre, Karigiri
North Arcot District
Tamil Nadu 632106, India

Blister Calendar Packs for Dapsone Monotherapy

TO THE EDITOR:

In 1982, the World Health Organization (WHO) published their recommendations for the treatment of all cases of leprosy with multiple drug therapy (MDT) in regimens of relatively short duration ([7]). Since that date, MDT has been widely applied in the majority of leprosy-endemic countries, and by the time of the XIII International Leprosy Congress in The Hague ([4]), WHO was able to report that by mid-1988, over 2 million of the approximately 5 million registered cases had been put on MDT, and that of those, over a quarter had completed treatment and were no longer considered to have active leprosy. On the basis of numerous publications and reports, it is now clear that the regimens advised are operationally feasible, acceptable to patients and health staff, clinically and bacteriologically effective, and not attended by an undue incidence of toxic effects or adverse immunological reactions. Most importantly, relapse rates for either paucibacillary or multibacillary cases have been remarkably low in the follow-up periods so far. MDT, properly applied, is capable of reducing prevalence rates by about 75% within 5–10 years, while at the same time reducing child and disability rates, and—in the somewhat longer term—incidence ([5]).

All of this is tremendously encouraging, and it is now clear that most people working in leprosy control are concentrating on the implementation of MDT as the most decisive tool available for this purpose. However, in this letter I would like to look at what one might call "the other side of the coin" and to ask if more serious attention should perhaps be given to the very large numbers of patients who are receiving a form of treatment (dapsone monotherapy) which was condemned well over a decade ago as being unsatisfactory and hazardous, mainly because of the risks of resistance. From the world total of registered (known) patients of 5.1 million ([6]) about 32% are currently on MDT. This obviously leaves about 68% who are not on MDT, and although precise information is (to my knowledge) not available, the likelihood is that the majority are taking dapsone monotherapy. An additional concern is that "dapsone monotherapy programs," with some notable exceptions, tend to be characterized by poor organization, weak supervision and defective operational support. The latter, at least in my experience, frequently includes defects in the ordering and dispensing of dapsone tablets, and in their presentation to patients in a manner which is likely to achieve regular daily intake, in the correct dosage, over adequate periods of time.

In 1983, in the Correspondence section of this journal, a letter was published advocating the use of "bubble" or "calendar"