specific sets of neurophysiological mechanisms. These are:

(1) In desensitization the mechanisms are: (a) habituation, and (b) the operation of a self-adapting sorting screen for the memory bank. Sokolov (1963) exposed a subject to a beep of a specified intensity and duration at irregular intervals. The EEG and galvanic skin responses were monitored. At first the changes in the tracings were characteristic of the orienting reaction. As the experiment continued the indices of this orienting reaction diminished until the beep no longer had any effect. Habituation had taken place. When the intensity of the beep was reduced without changing the other variables the tracings indicated another orienting reaction. From this it appeared that habituation was not the result of fatigue in the neural elements but rather the action of a process against which incoming sensory signals are matched. Any change in the character of the beep had this orienting effect. Even sudden silence could become an activator. This process appears to be incorporated into a self-adaptive sorting screen which contains coded representations of prior signals brought about by person-environment interaction. These coded representations are matched against incoming signals. If there is constancy in this system the encoding is strengthened, leading to expectancies of environmental condition. This reduces or stops the orienting response. It needs to be stated that an exaggeration of the orienting response is accompanied by anxiety,

In therapeutic desensitization, habituation is favoured where the screening way-station matches incoming stimuli against the imaginal suggestions of the therapist.

By approximating a match between the imagery and the phobic content the necessity for an orienting reaction is diminished or altogether abolished. Consequently no alarm reaction takes place. Ideally the sorting screen permanently acquires a new set of encoded information which contains the elements of the phobic situation—or to put it in vernacular: familiarity breeds contempt.

(2) The flooding follows the principle of counter-irritation. Counterirritation should not be confused with the principle of reciprocal inhibition originally proposed by Sherrington which was extrapolated as a concept by Wolpe when he substituted imaginal representation of the feared conditioned stimulus for actual exposure—a generalization based on very tenuous grounds. When two stimuli vie for competitive acceptance by the nervous system each one tends to diminish the other (Jonas, 1962). This mechanism, by the way, may account for the anaesthetizing effects of acupuncture. Gripping the arms of the chair while the dentist drills one's tooth is a familiar example. In one experiment carried out in a different context I exposed an agoraphobic patient to a truly terrifying movie sequence of a head-on collision filmed from inside the crashing car. After three run-throughs of the same scenes the patient made the following significant remark: 'Going through a car makes my fear seem so insignificant . . . But . . . well . . . (shrugging his shoulders) in that car crash . . . you die only once'. Thus the flooding need not be specific as long as it possesses similar anxiety-provoking potential as the phobia itself, and therefore it appears to be a non-specific counter-irritant.

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SCOTTISH AND ENGLISH SUICIDE RATES

Dear Sir,

The Scottish suicide rate has been lower than the English for seventy years, but the difference may be an artefact, the result of differing ascertainment procedures, the Scottish Crown Office placing more borderline suicides in the category 'undetermined deaths'. I argued (Barraclough, *Journal* (1972), **120,** 267–73) from the 1968 suicide statistics that the incidence of suicide in the two countries was probably the same.

The purpose of this letter is to show that the 1971 mortality statistics for violent deaths (quoted by permission from the General Register Office), the most recent available, are consistent with there being a *greater* incidence of suicide in Scotland than in England. (See Table Overleaf)

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Suicide, undetermined, accidental death rates, per million population 15 and over. England and Wales and Scotland, 1971

	Numbers E. and W.	Scotland	Rates E. and W.	Scotland	Difference in rates	Twice S.E. of difference of the rates
Suicide rate (SR)	3,941	377	106	98	8	10
*Undetermined rate (WR) ..	1,099	223	30	58	28	8
Accident rate (AR)	1,465	162	39	42	3	7
*SR+UR+AR	6,505	762	175	198	23	15
*AR+UR	2,564	385	69	100	31	10
*SR+UR	5,040	600	136	156	20	13

* Indicates a difference in the rates significant at 5 per cent.

SALIVA AND SERUM LITHIUM ESTIMATIONS IN PSYCHIATRIC PATIENTS

DEAR SIR,

The beneficial therapeutic action of lithium carbonate in the prophylaxis of the affective psychoses has been established by Coppen *et al.* (1971) and Hullin *et al.* (1972). The importance of monitoring lithium at a therapeutic level has been stressed. When serum estimations are used the therapeutic limits are 0·7–1·3 m. Eq./L, and thus serial readings are required for maintenance. Toxicity occurs with serum levels of 1·6 m. Eq./L or above (Schou *et al.*, 1968). Thus regular venous samples are required for monitoring the serum level of lithium.

The following study was carried out in a weekly clinic dealing solely with the biochemical stabilization and control of patients receiving treatment with lithium carbonate. The clinic had been operational for eight months and had 40 patients undergoing maintenance therapy from a psychiatric hospital with a catchment area population of 450,000. Patients attended for serum estimation, initially weekly and then at gradually increasing intervals up to six-weekly when full stabilization had been reached.

Despite a rapid service from the laboratory, attendance at the clinic for venepuncture, estimation of serum lithium and regulation of dose occupied the greater part of the morning. (The method used for lithium estimation was described by Brown and Legg (1970) from the laboratory where our estimations were carried out). Over the trial period patients were asked to provide a 5 ml. sample of saliva in addition to their venous sample. Both samples were collected between 9.30 and 10.30 a.m. Whilst dosage monitoring was carried out solely from the serum estimations, serum and saliva levels were compared using the same method. Salivation was facilitated by sucking a pebble and by visual stimuli; no sialogogues were used.

For this study, no account was taken of the formulation of lithium carbonate, nor of any other medication the patient was receiving.

Over a period of 19 weeks, 88 estimations of synchronous serum and saliva lithium were carried out in 25 different patients. The findings are represented graphically (overleaf).

The correlation co-efficient for the relationship between serum and saliva values was carried out as follows:

All values (N = 88) $r = 0{\cdot}384$ $p < 0{\cdot}001$.

If it is intended that the dosage of lithium should be monitored using saliva samples, therapeutic limits for saliva must be devised. Regression lines were calculated but are not shown here, as further work is required to establish the validity of the assumption of a linear relationship.

Burgen (1958) reported that lithium concentrations in saliva were related to, though higher than, those in plasma at low saliva flow rates. At higher flow rates, using chemical sialogogues, they approximated to plasma levels except that the saliva : plasma ratio for lithium was independent of the absolute plasma concentration. Spring and Spirtes (1969) similarly demonstrated in five healthy individuals a direct relationship between saliva and serum concentrations of lithium when the salivary glands were not stimulated. In our patients lithium estimations were carried out under constant conditions and at the same time of day, using saliva produced by salivary glands stimulated only by sucking a pebble; saliva levels were consistently higher than serum levels, and the two levels correlated.

As all these patients remained euthymic for the duration of this study, changes of saliva volume with mood were considered irrelevant.

If the method fulfils its early promise of effectiveness in controlling lithium medication (an ongoing study is in progress at the clinic to establish threshold limits for saliva and also the possibility of monitoring