

6. With regard to each assumption stated above: (i) Unilateral application of KCl has been reported to reduce EEG bilaterally [M. Gollander and S. Ochs, *Amer. Psychologist* **18**, 431 (1963)], and to reduce evoked responses in both depressed and control hemispheres [N. Freedman and A. Langford, *J. Comp. Physiol. Psychol.* **69**, 362 (1969)]. (ii) Application of saline does not terminate CSD (as measured both by ECoG reduction and slow-potential changes) within the time limits assumed by Albert (T. J. Carew, T. J. Crow, L. F. Petrinovich, report to the Western Psychological Association, Los Angeles, 1970). (iii) Electrocortical and behavioral correlates of CSD, rather than remaining constant over the period of KCl application, actually wax and wane. It has been demonstrated that locomotor activity increases during the "recovery" phase of CSD, and that training under

- different amplitude phases of CSD produces differential performance [N. Freedman, R. Pote, R. Butcher, M. Suboski, *Physiol. Behav.* **3**, 373 (1968)]. (iv) Application of electrolytes such as KCl to cortical surfaces has been reported to cause injury to cortical and even subcortical structures (see 4), and to cause extensive cortical damage as a function of concentration [M. Hamburg, P. Best, R. Cholewiak, *J. Comp. Physiol. Psychol.* **66**, 492 (1968)].
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* Present address: Departments of Physiology and Psychiatry, New York University Medical School and the Public Health Research Institute of the City of New York.

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"Behavior Induction" or "Memory Transfer"

A recent report by Golub *et al.* (1) concerning "Behavior induction" or "memory transfer," produced by injections into naive animals of extracts from brains of trained animals, could conceivably give rise to a new wave of studies on this issue. This comment is an attempt to aid present and future workers.

Near the end of their report, Golub *et al.* say, "When additional treatments, such as extended overtraining or the interpolation of extinction training between acquisition sessions, are introduced into the donor-training phase of transfer paradigms, these incubation periods are probably unnecessary." Although this statement is not particularly strong, it might give the reader the impression that he could use several variations of the procedure used by Golub *et al.* (1) and still expect to obtain an effect on the recipient rat's behavior. However, it is my opinion that future research should start with the procedure (identical in all details) used by Golub *et al.* (1) and continue with this procedure until the replicability of the results is clearly determined.

As a supporting case on the point of extended overtraining being a sufficient substitute for "incubation periods," I refer the reader to a recent report from our laboratory (2) which described a series of attempts to obtain a transfer effect. The eighth experiment in this series involved considerable overtraining; however, the naive recipient animals showed no effect of the donor training.

This experiment differed from those reported by Golub *et al.* (1) in many details, any one of which could conceivably be blamed for our failure

to obtain a transfer effect. However, most of the details of our study were identical to those of previous studies by other workers which had yielded positive results. The fact that not all of the details were the same (because we lacked access to identical equipment) led some critics to say that our work did not constitute a true replication attempt.

To reiterate the point of the communication—workers who enter this area would do well to copy the technique of Golub *et al.* (1) in all details to determine the replicability of the effect before going on to examination of the phenomenon.

JOHN A. CORSON

Department of Psychiatry,
McGill University,
Montreal 110, Quebec, Canada

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We believe, and have so stated on several occasions (1), that the "transfer" experiments should always be repeated as carefully as possible in order to determine the critical variables

necessary for the effect to occur. We assuredly did not intend to give readers the impression that variations in our procedures would necessarily yield results identical with those found in our laboratory. In fact, we stated [see reference 7 in (2)] that "Detailed procedures are available to investigators interested in repeating these studies." Our intention was to provide interested colleagues with the information necessary to repeat our experiments as exactly as possible and thus to discourage variations of the procedure.

On the other hand, we do not believe that small discrepancies typically have been responsible for the failure of some investigators to replicate the "transfer" phenomenon. Clearly, in some attempts to repeat successful "transfer" studies, investigators have used different paradigms (3), different injection routes or dosages (4), or different behavioral or chemical procedures (4, 5) from those used in the experiments they purported to replicate, and such studies are not legitimate replications.

Again, we wish to express agreement with the intent of Corson's message and to apologize to the readers if what we believed was a clear plea for careful replication was misinterpreted.

ARNOLD M. GOLUB

FRANK R. MASIAZ

TRUDY VILLARS

JAMES V. MCCONNELL

Mental Health Research Institute,
University of Michigan,
Ann Arbor 48104

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Bat-Guano Cave Environment

Poulson and White, in a recent discussion on the utilization of caves as natural laboratories, suggested that the relatively constant cave environment, together with the comparative simplicity of cave communities, facilitates the study of evolutionary and ecological problems (1). This approach to bio-

speleology certainly gives emphasis to a particularly interesting aspect of caves (1, 2), but it tends to give the impression that all cave organisms live in environments of high constancy. It also detracts from the potential interest of those caves that contain animal communities of relatively high diversity—