The cocarcinogenic power of the individual substance, on the one hand, and the nature as well as the intensity of the morphologic changes that it induced in the skin, on the other hand, seem to be dependent, for example, on the position of the compound in the hydrophile-lipophile balance value series (*6*) when certain un-ionic synthetic detergents were used. The mechanism of the physicochemical and morphologic alterations in the cutaneous structures is now being studied, considering especially the property of nonpolar-polar substances to alter (and degenerate) various proteins as well as the binding of water, which seems to be one of the features of the induced change. In this connection we want to draw attention to the influence (*3*) of nonpolar-polar compounds on proteins, for example, denaturation with resulting liberation of biologically—and possibly also for the tumorigenesis—important —SH— and other groups, changes in solubility, alterations in molecular weight and shape, changes in antigenity and susceptibility to enzymatic digestion as well as changes in x-ray diffraction patterns and infrared absorption spectra. Interesting also is the appearance of fiber formation in various cutaneous structures as a result of treatment with nonpolar-polar compounds (the same phenomenon is well-known from studies *in vitro*).

Our present experiments with these compounds have given us the impression that the histologic changes seen in connection with the "early response of the mouse skin to carcinogens" are, for the most part, only comparatively nonspecific phenomena running parallel to the still unknown process of carcinogenesis, or being merely a reflection of this occurrence. Apparently the processes in the various structures of the skin also run parallel to each other, none being the real cause of the others. By varying the character of the cocarcinogenic nonpolar-polar compound (and thereby the quality and localization of the morphologic and chemical alterations) and the concentration of the carcinogen, it may be possible to induce skin tumors under more strictly controlled conditions than hitherto. In this way we are now trying to investigate which chemical and morphologic alterations are really necessary for the production of experimental skin tumors in mice and what is necessary for the achievement of a cocarcinogenic effect as well as the interaction between the stromal and parenchymal alterations during tumorigenesis.

Fig. 2. Skin (left side of the back) of mouse No. 54; no treatment at all. Normal appearance. This specimen was taken at the same time that the specimen in Fig. 1 was taken. H + E. (× 85)

The results of the protein-chemical findings, as well as the details of histologic findings, will be reported elsewhere.

KAI SETÄLÄ
HEIKKI SETÄLÄ
PAUL HOLSTI

Department of Pathology,
University of Helsinki, Finland

References

1. K. Setälä, *Nature* **174**, 873 (1954).
2. ———, *Ann. Med. Exptl. et Biol. Fenniae (Helsinki)* **26**, 126, 130 (1948); *Acta Pathol. Microbiol Scand.* **26**, 223, 280, 682 (1949).
3. F. W. Putnam, *The Proteins* **1**, 807 (1953).
4. I. Berenblum, *Advances in Cancer Research* **2**, 129 (1954).
5. K. Setälä *et al., Cancer Research,* in press.
6. *Surface Active Agents* (Atlas Powder Co., 1950).

22 June 1954.

Living Out "Future" Experience under Hypnosis

Rubenstein and Newman in their article, "The living out of 'future' experiences under hypnosis" [*Science* **119**, 472 (1954)] raise some issues that may require clarification. In describing a technique that deals with the projections of hypnotic subjects' experiences into a future time, they have presented a clinical modification of a time-progression and fantasy-projection technique recently reported upon by Israeli [*J. Clin. and Exptl, Hypnosis* **2**, 49 (1953)]. Although their report is of considerable interest with respect to personality study and projection in general, the authors do not make it clear that the technique they employed was one of *time* distortion rather than one of *age* alteration. Nevertheless, from their observations, they conclude that, since this type of projection appears to be essentially a fantasy, perhaps hypnotic age regression, too, is a fantasy. In view of the fact that the authors deal with time and not age as a variable within the framework of their hypnotic experiments, it appears dubious that their extension and generalization of findings to include alterations in age variables, particularly age regression, is meaningful.

It must be pointed out that there is a definitive difference between hypnotic *age* "regression" and "progression" and *time* "regression" and "progression." With alterations in time, recent experimental experience indicates that the subject tends to alter his perception of the world around him in the same manner that he does in all basic expressions of projection—that is, in a manner consistent with his inner personality organization. Clinical techniques, such as the

Thematic Apperception Test and the Rorschach Test, deal with elements of the way in which perceptive functions are influenced and altered by inner emotional and ideational forces. With hypnotic techniques of time alteration, the subject tends to reflect no apparent change in body-image, impulse handling, or other major dimensions of personality functioning. On the other hand, with techniques of age regression and progression, there appear to be some alterations in body-image and self-concept, with changes in the organization of expressive behavior related to these primary activities.

The validity of hypnotic age regression lies not in the actuality of reproductive elements of behavior but rather in the perception of the body-image and the *level* and *manner* of behavior organization. Memory variations and simulations take place within valid and nonvalid instances of hypnotic age regression. The difference and, consequently, the validity of the phenomenon of age regression are to be found not in the projective behavior but in the behavior organization processes. The hypnotic technique of "time progression" reported upon by Rubenstein and Newman may be a useful projective technique, but it does not appear to relate directly to the problem of hypnotic age regression or to question its validity.

MILTON V. KLINE, *Editor*
Journal of Clinical and Experimental Hypnosis
330 West 72 Street, New York 23

22 April 1954.

R. Rubenstein and R. Newman [*Science* **119**, 472 (1954)] discuss their hypothesis of hypnotic age regression. Our pilot study gives experimental support for their viewpoint.

Five deeply somnambulistic subjects were individually hypnotically regressed to two specific past birthdays for each subject. Birthdays that had fallen either on a Saturday or a Sunday—that is, on nonschool days—were chosen by the experimenters. After regression, the subjects were asked to describe the activities of the selected day in order to elicit from them a commitment on whether or not they had attended school on that day. When a subject did not yield the desired information through free description, the experimenters employed a subtle questionnaire to obtain this information. When this information had been obtained, the digit memory span portions of the Stanford Binet test were administered, moving down from the subject's actual age level to his regressed age level. The subjects' regressed ages were from 8 to 15 years; their actual ages were from 21 to 25 years.

At the regressed levels all the subjects responded appropriately on the digit span test, failing levels associated with higher age groups. Four of the subjects incorrectly stated that they attended school on both the weekends involved. The fifth subject also incorrectly described a school day for her 9th (regressed) birthday but correctly identified the day for her 14th birthday. This correct identification was accompanied by a general emotional abreaction and an explanation that her grandfather had just died. A subsequent check with the subject's family verified the date of the death, and the same information was recalled by the subject in a waking state.

The criterions chosen for this study would seem to give the subjects the greatest possible chance to prove age regression. A birthday in itself is usually a memorable experience in a child's life, and its details might be expected to stand out clearly in the "reliving" experience of age regression. The fact that all the birthdays fell on weekends, which alone have high hedonic tone for children, might heighten awareness of the experience. However, none of the subjects could locate themselves in time and were trapped into descriptions of events in school that could not have occurred, the hypothetical event having been on a day when there was no school. Nevertheless, the subjects went on at length in their descriptions of the people present and gifts received on these birthdays. Also all the subjects had "regressed," for they all responded to the digit memory span test at the proper age level. It should also be added that the relatively nonobjective measures of graphology and verbalization level roughly coincided with the "regressed" age. Thus it would seem that, even though the subjects were given the benefit of a very convenient situation, they could not tell on which days of the week their birthdays fell or even that they were on a weekend.

The results of this study tend to indicate that age regression is not true and complete. Subjects cannot return under hypnosis, at the will of the hypnotist, to *any specific* time or place in their personal history. It is our belief that, under the pressure of hypnotic suggestions, subjects have heightened recall of an age *level* of their personal experience rather than of a specific time or place from their history. Although this type of recall may be clinically useful, it is questionable whether it can be defined as age regression. Coupled to this type of recall are the present adult experiences with children of the age to which the adults have regressed. These two types of experience were interwoven in the hypnotic fantasy to present a complete experience that will relieve the subject from the pressures of the suggestion exerted by the hypnotist.

Our conclusions are presented as corroboration for the hypotheses expressed by Rubenstein and Newman. A criticism that may be leveled at their report, as well as ours, is the unreliability of the information contained in a sample of five cases. Certainly one would be hesitant to place much statistical validity on the data presented. It is hoped, however, that further research may be undertaken to place the problem of age regression in a more realistic perspective than heretofore held in psychological thinking.

HAROLD L. BEST
RICHARD M. MICHAELS
Psychology Department,
George Washington University, Washington, D.C.

7 May 1954.