

The Production of Blisters by Hypnotic Suggestion: Another Look

GORDON L. PAUL, M.A.

This paper presents a critical evaluation of reported attempts to produce nonherpetic skin blisters through hypnotic suggestion. Even though the majority of these reports are grossly lacking in controls, experimental design, etc., and are subject to alternative explanations, the author concludes that skin anomalies have been produced by suggestion in some instances. Additional studies of psychogenic vascular changes add credence to the possibility of central control of these phenomena. It is also concluded that these reactions do not appear to be limited only to hypnotized Ss.

“**HYPNOSIS**” has been variously defined by a multitude of authors since the time of Mesmer’s “animal magnetism.” A recent definition of the term by Gorton¹⁰ seems to be most inclusive and one which few current workers in the field would dispute. Gorton states that hypnosis is “an artificially-induced state, characterized by heightened suggestibility, as a result of which certain sensory, motor, and memory abnormalities may be induced more readily than in the normal state.” Thus, defining hypnosis, it seems rather strange that Gorton proceeds to state the purpose of his paper to be “. . . to examine the physiological changes transcending ordinary voluntary capacity.” This latter statement reflects one side of a recurring argument about hypnosis. White²¹ was probably the most dogmatic exponent of

this view, stating that “hypnotic transcendence of voluntary capacity or volitional control” was one of the main features which makes hypnosis a perennial object of wonder and amazement. White’s main argument, also, was based upon the physiological effects purported at the time. Still, another investigator²⁸ claims his “study” to show that: “Under hypnosis it is possible to demonstrate an inter-relationship between the psychic processes and localized peripheral effects which far transcends the ability of the individual in the conscious state.”

Another school of thought was stirring in the seeds of skepticism when Babinski questioned some of the physiological effects attributed to hypnosis at a discussion held in 1908 by the Société de Neurologie in Paris.²⁴ Young³² then demonstrated the necessity of comparing hypnotic behavior with “normal waking behavior” if causation is to be attributed to hypnosis. Young further demonstrated that much behavior under hypnosis was due to subject (S) peculiarities, which could also be produced in the waking state. Following

From the Department of Psychology, University of Illinois, Urbana, Ill.

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closely on Young's footsteps, Hull¹² published the first real scientific treatise dealing with hypnotic phenomena, in which he postulated the fundamental question—i.e., "Can organic functions which are not under voluntary control be modified or controlled by hypnotic suggestion?" Hull concluded that all physiological effects of hypnosis to that time could be explained by (1) conditioned reflex, and (2) intercurrent emotional states. He also proposed changing the term of incident "involuntary control" of many autonomic functions to "indirect voluntary control," since these functions could be elicited in waking Ss by just "talking."

Pattie²⁴ pointed out that, though Hull had done an excellent job of explaining certain physiological effects, one series of reports had been conspicuous in its absence. This omission was the formation of blisters from the touch of a cold object. The importance of this omission, Pattie claims, is because "The processes which produce blisters on the skin are certainly not under direct or indirect voluntary control." Many reviewers since Pattie (e.g., Gorton,¹⁰ Weitzenhoffer,²⁰ Sarbin,²⁵ Orne,²³ and Barber³) have turned attention to reproducible physiological effects in general, and nonherpetic blister production in particular. The consensus has been (with the exception of Gorton) that most behavior of the so-called involuntary functions which can be effected under hypnosis can also be obtained in the waking state. As Weitzenhoffer²⁰ reports, these effects only require a reorganization in our thinking of psychosomatic and somatopsychic relationships. Weitzenhoffer²⁰ and the more recent reviewer, Barber,³ have done an admirable job in reviewing the available evidence on the physiological effects obtainable during trance, ranging from gastric functions to wart reduction. Barber also demonstrates adequately that these same effects, if to a lesser degree, can also be produced in waking Ss. The one effect which none of the reviewers has well demonstrated in

waking Ss, or really shown to exist in hypnotized Ss, is the same function which Pattie²⁴ pointed out—i.e., the production of (nonherpetic) blisters by hypnotic suggestion. One reviewer²⁴ doubts that the effect is tenable, lacking a specifiable mechanism; two reviewers^{3, 20} point out a similarity between wheal production and blister production but do not attempt to show that direct suggestion could elicit either; Gorton¹⁰ merely states that no available theory accounts for the phenomena, and is content to leave the supposed blister production as one of the marvelous mysteries of hypnosis, while Orne²³ and Sarbin²⁵ attribute the effect to peculiar predispositions of the Ss. The latter author does attempt an explanation of the effect, which will be covered later.

In view of the above information, a review and evaluation of all reports on nonherpetic blister production seemed necessary: first, to determine if the "clinical lore" had any basis in fact; secondly, to review the physiology involved to see if such an effect is tenable.

Survey of the Literature

Pattie,²⁴ following Hull's treatise,¹² took it upon himself to search through all the literature up to 1941, including foreign publications, reporting attempts at producing blisters under hypnosis. He was able to find only 16 reported attempts, involving 14 Ss. Two of these reports were "scientifically without value," due to a complete failure to give account of the procedures used; one of the reports was discounted because of discovery that the S had induced self-injury; and two reports, by experimenters who were retained, were excluded because of a failure to report procedure and controls used. Thus, Pattie was left with a total of 10 articles covering 11 "experiments" in the period before 1941. Of these experiments, only one was in English, and the total number of all the experiments was 11;

these were not in a 1 to 1 proportion. Weitzenhoffer²⁹ again surveyed the literature, from 1886 to 1952, and found the articles reviewed by Pattie to be the only reports to give even a fair account of procedures and controls. Barber³ was able to find two additional reports of "successful" blister production since Pattie's paper. Wells³⁰ reported an attempt, with questionable results, and Sarbin²⁵ reports that he has attempted blister production and failed. (No account was given of the procedure, and therefore, according to the Pattie-Weitzenhoffer criteria, is meaningless.) In a comprehensive review of all the available literature, from 1953 to 1962, the present writer was able to find only one report of blister production under hypnosis⁹ in addition to those reported by Barber³ (See footnote, Table 1). This latter report can be discounted, also, because of a complete failure in reporting procedure and controls, plus the fact that the entire book is invalidated by the popularized, mystical claims of the author.

Table 1 summarizes the primary features of the studies reported to date. Disregarding No. 15, we are left with a total of 14 reports with a like number of Ss on which the phenomena of hypnotic blister production is based. None of the experiments are exactly comparable in procedures or controls. Typically the general procedure was to hypnotize the S (all Ss were capable of a somnambulistic trance) and then touch some localized area of skin with a definite object, suggesting that the object was "red hot" or would produce a "burn," a "blister," "redness," or some combination of these. In some cases the stimulus object was left in contact for the entire period, but in others contact was only a pressure of short duration. In one instance, No. 11, no object was used, the area being marked off by a grease pencil. After suggestion, some Ss were "awakened" while others remained in a trance for the entire period. Some gave direct suggestions as to the time of blister production while others did not. Some Es ob-

served the area for the duration of the experiment; some bandaged the area and observed the S; some dismissed the subject for periods of 4-48 hr. (in one instance, a full week) after suggestion—some bandaged and some not. In at least two of the reports, No. 11, and 12, blister production was only of secondary interest. Under "Results," Table 1, the reports in the language of the various authors may be found. The majority are limited to external observations by laymen, but a few were dermatologists, and some performed biopsies. Time intervals varied from 9 min. to 24 hr. for blister production, and from immediately to 7 hr. for erythema formation. In three instances, No. 3, 7, and 8, the blister was in a different location from the stimulus, while in one report, No. 11, spontaneous blisters began to appear all over the S's body.

Evaluation of Studies

Previous evaluations of some of these studies have run from blanket approval¹⁰ to complete rejection.²⁴ It must be stated at the outset that all the reported studies suffer from a lack of rigor in reporting, experimental design, or both. They also have, for the most part, the tinge of afterthought in clinical report.

Not one of the studies even approaches the basic design postulated by Sutcliffe²⁷ for experiments on hypnosis, lacking primarily the use of comparable waking controls. Only one study, No. 1, attempted to use even a single control S, and this was only to the extent of putting postage stamps (the stimulus) on "another person" for 18 hr. Sarbin,²⁵ among others, has specifically criticized the select sample of Ss, and the use of hysterics in particular. From Table 1, under "Subject," it may be seen that: 7 Ss were hysterics, 2 Ss had suffered previously from neurotic disorders, and 3 Ss were reported to have lively vasomotor reactions, delicate skin, dermatographia, or dermatitis; only 2 ap-

TABLE 1. SUMMARY OF REPORTS PURPORTING NONHERPETIC BLISTER PRODUCTION

<i>Experimenter</i>	<i>Subject</i>	<i>Stimulus</i>	<i>Location</i>	<i>Covering</i>	<i>Observed</i>	<i>Results</i>
1. Focachon (1886)	Hystero-epileptic, F	Postage stamps	Shoulder	Postage stamps & dressing	No	Area surrounded by redness & swelling (21 hr.); later, separated blisters
2. Von Krafft-Ebbing (1889)	Hysterical right hemianesthesia, F	Metal, K	Left shoulder	Multiple bandages & seals	No	Epidermis detached at several areas; immediate areas were red (overnight)
3. Jendrassick (1888)	Same S as Von Krafft-Ebbing	Metal, K?	Left upper arm	None	Yes	Positive reaction, symmetrically located on right arm (5 hr.)
4. Rybalkin (1890)	Major anesthetic hysteria, M	Metal stove "posthypnotic"	?	Bandage	No	Redness (3 hr.); papular erythema; (overnight); two blisters
5. Doswald & Kreiback (1906)	(a) Delicate skin, lively vasomotor Rs, M (b) Exneurotic skin gangrene; wheals, F	Match stick	Forearm	None	Yes	Blister (9 min.); biopsy: epithelial necrosis characteristic of neurotic skin gangrene
6. Heller & Schultz (1909)	Delicate skin, med. grade dermatographia, M	Match stick	Forearm	Sealed cardboard tube	No	Hyperemia & edema of papillary body (24 hr.); biopsy: dilatatory erythema with varied degrees of epithelial necrosis—no blisters
7. Podjapolski (1909)	Previous hysterical aphonia, F	Coin (a) Coin (b) Metal case	Hand, dorsum Back Back	Sealed cotton-wool bandage ? ?	Yes Yes Yes	Half wheal & half flat, hard blister in area size of coin (6 hr.); only redness after 30 hr.; scar after 5 days—no biopsy Erythema (7 hr.); swollen red field with blisters (11 hr.), 3 cm. low Erythema (7 hr.); single blister which had opened (11 hr.), 1 cm. low
8. Smirmoff (1912)	"Healthy," F	(a) Button (b) Copper	Rear upper arm Rear lower arm	None None	Yes Yes	Redness (15 min.); a white blister surrounded by redness—lower Redness at point of 1st stimulus; erythema between old & new stimuli; swelling, whiteness, & white blister (2 hr.)

9. Wetterstrand (1915)	Hysterical, F	Touch?	Right forearm	Dome, rubber bands, adhesive plaster	No	Dermatologist testified to appearance of blister (24 hr.)
10. Hadfield (1917)	Shell shock, M	(a) Touch? (b) Touch?	Anterior forearm Lateral upper arm	Sealed bandage Sealed bandage	No Yes	Blister on spot, epithelial necrosis in center, liquid beneath, hyperemia surrounding (6 hr.) Beginning of blister (24 hr.); formed a large bleb surrounded by inflammation during day
11. Schindler (1927)	Hysterical ecchymoses, F	Suggestion only	Spots about body	Plaster cast, watch glass	Yes	1st ecchymoses on command, then blister of clear fluid, followed by hemorrhage; spontaneous blisters; full blisters on command in 5 min.
12. Wells (1944)	Somnambulistic psych. student (1924), M	Coin	Forearm	None	No	S reported blister within 35 min., but E reported no tissue change resembling blister when experiment terminated (3 hr.)
13. Ullman (1947)	Previous hysterical blindness—war neurosis, M	Small flat file	Hand, dorsum	None	No	Early blister formation noted in 1 hr., observed; returned 4 hr. later with 1-cm. bleb
14. Borelli & Ceertz (1953)	Neurodermatitis atropic, M	Coin	Hand, normal	?	No	Sharply circumscribed spot resembling blister, but more appropriately described as white dermographism
15. Erskine (1957)	Hypnotherapy for eye discharge, M	Direct suggestion	Nape of neck	None	No	Pus-filled blister on following day; disappeared after cause was revealed

Four additional cases reviewed by Pattie⁸ were not reported by him since the reports were "scientifically without value," due to a lack of description of methodology. Number 15, above should probably be discarded for this reason also. Two articles which may or may not report additional studies on blister production were unavailable to this writer; these were: 1. Chapman, L. F., Goodell, H., & Wolff, H. G. Changes in tissue vulnerability induced by hypnotic suggestion. *Fed. Proc.* 16:1957. 2. Gorton, B. E. The physiology of hypnosis: II. Vasomotor activity in hypnosis. *J. Am. Soc. Psychosom. Dent.* 4:132, 1957.

pear to be "normal," but the reporting of S characteristics was not sufficient to evaluate these. Both of these two "normal" Ss are known to be easily hypnotizable to a somnambulistic state. Even if the sample were not biased, the number is so small that the effect could not be specifically attributed to hypnosis, much less generalized to a larger population.

The lack of experimental controls is an even greater flaw than the lack of control Ss. Orne²³ has emphasized the "demand characteristics" of the hypnotic experiment, and mentions how this "demand" behavior of the Ss has led many to think physiological capacities have been transcended. A case in point which has led to just criticism of the blister studies comes from an article by von Schreck-Notzurg in 1896.²⁴ This author reported positive results with hypnotic blister production using poor controls. The same S was used again, but bandaged over the suggested area. In this case it was discovered that the S had attempted self-injury by rubbing the area and inserting a needle through the dressing. A cast was then used to protect the area, leading to negative results, with evidence of an attempt at self-injury. It becomes apparent that any study in this area must include constant observation of the S, particularly when using neurotic patients, to rule out this possibility. On this basis alone, Reports 1, 2, 4, 10a, 12, 13, 14, and 15, become questionable, if not entirely invalid. In fact, the S in No. 13 was seen to rub snow vigorously on the area of erythema, which could account for bulla formation.⁴ Although the S in No. 5b was not observed during the entire period, an ingenious and effective device for the prevention of self-injury was employed, and that study is not to be criticized on those grounds.

Before evaluating the studies from the point of suggestion and stimulus contact through the final results, it might prove somewhat enlightening to review the process of blister production resulting from actual tissue damage

Lewis¹⁷ has described the response of the skin to a noxious excitant as a "triple response." The three phases of this response are: (1) local red reaction, which is only a result of the active relaxation of the capillaries as a direct function of pressure; (2) flare, flushing of the skin or erythema as a result of the dilatation of arterioles (This reaction is the result of the release of a diffusible histamine-like substance (H-substance) from the epidermal cells at the point of contact. Lewis believes this H-substance acts as a stimulus for the sensory branch of an axon reflex, resulting in arteriole dilatation.); and (3) wheal, which is a raised swelling of the skin in the area of the stimulus, resulting from local edema (collection of serous or plasma fluid in the areolar tissue). The edema is due to the outpouring of fluid from the vessels which have increased permeability on dilatation. This "triple response" can be brought about by mechanical, thermal, or chemical stimuli; however, in hypersensitive skins, very slight mechanical stimulation will result in the reaction even more readily than with thermal or chemical stimuli. This is particularly so with demographism, or urticaria.

The close relationship between rash, wheal, demographia, and bulla or vesicle (blister) production is readily seen when note is taken of the physiology of skin blisters themselves. The formation of vesicles or bullae is just a further extension of the "triple response," in that increased interstitial edema reaches a degree at which the epidermal cells can no longer resist the pressure of the fluid. At this point, the cells become separated and the fluid rushes in, collecting to form a vesicle or bleb.¹⁸

This short resumé is far from complete on the physiology of production, but will suffice for the basic groundwork. Other relevant information will be pointed out within the text.

With some amount of bullae physiology in mind, we turn to the various stimuli which have been employed in the hypnotic reports. Pattie²⁴ originally mentioned the possibility of confounding by mechanical stimulation, and Weitzenhoffer²⁰ and Barber³ have both elaborated this possibility. In several of the reports, the stimulus object was reportedly "pressed" upon the skin, often leaving a circumscribed red mark; i.e., the local red reaction of the first phase of the triple re-

sponse. It is therefore at least a possibility that those experimenters who used some well-defined physical object as a stimulus were actually initiating some phase of the triple response by mechanical excitation. Reports 2, 4, 5, 6, 7, 12, 13, and 14 are particularly open to this possibility, and Reports 9, and 10 might also be included, except for their failure to report what Ss were "touched" with. Credence is added to this alternative by the fact that several results appear to resemble dermatographia or edema rather than full bullae. Still another possible source of confounding by the stimulus objects appears in the medical syndrome of dermatitis venenata or contact dermatitis.¹ The stimulus objects applied in Reports 2, 3, 4, 6, 7, 8b, 12, and 14 are known to be metal objects, several of which were coins. Schwartz and Warren²⁶ report a host of studies in which contact dermatitis was specifically traced to metals as the excitant. Almost all metals have been a source of venenata, but coins, particularly nickel, seem to be one of the more popular. Each of the blister studies mentioned above, with the exception of No. 3 and 8b is therefore open to this criticism. Reports 3 and 8b would appear to be free from criticism with regard to possible contact dermatitis, as well as dermatographia from mechanical stimulation, since the positive response appeared at a different location than the stimulus. The S in Experiment 7 was also reported to show a response at a different spot from that to which the stimulus was applied, but the variation was at maximum 3 cm., which does not rule out edema from the local initiation.¹⁸ Another finding reported by Schwartz and Warren²⁶ points out an extremely questionable practice in the studies under consideration. The reference here is to a study in which over half (63 of 120) of the Ss tested showed a positive reaction in the form of contact dermatitis or irritation of mechanical stimulation, to one or more of eight adhesive plasters tested, when the adhesive re-

mained in contact with the skin for a period of time. This finding casts doubt on several studies, particularly No. 1, in which postage stamps were pasted to the S's back and remained there for over 21 hr. The fact that a "control S" was used does not lessen this possibility since there was only one control S; that S was "another person"—i.e., not hysterical, and the stamps were left on the skin for a shorter period of time without additional dressings. Several other studies which report the skin area to be covered by a bandage can also be questioned on these grounds, unless it was specifically reported that an adhesive substance was not placed directly over the area. Studies that may be questioned on these grounds include No. 1, 2, 4, 6, 10b, and possibly 7 and 14. The matchstick used in No. 5a and b may also have been a specific irritant, since some 12 types of woods, including soft woods, as well as sulfur have been known to cause contact dermatitis.²⁶

Still another source of doubt as to the hypnotic cause of many of the positive results reported comes from a second source of edema. It will be remembered that the major source of edema was the dilatation of arterioles, allowing escape of fluid in the "triple response" reaction. A second source of local edema may be seen in mechanical edema.¹⁸ The primary source of this skin anomaly is from "a tight bandage obstructing the veins. . . . If this type of edema is excessive, the interepithelial lymphatics participate and vesicles or bullae appear in the epidermis." It would seem that many of the investigators, in their zeal to avoid the possibility of the Ss inflicting self-injury, have in fact induced the "injury" themselves. This unfortunate "control" confounds the reports of No. 4, 6, 9, 10, and possibly 14.

Previous reviewers³,²⁹ have invested the majority of their time in pointing to results in which it is questionable as to whether bullae were actually produced, or whether the reactions were better described as wheals, dermatographia, etc. In

view of the close relationship between the various reactions, as seen in the "triple response,"¹⁷ this writer does not see the necessity of retracing these steps. It should only be pointed out that some of the reactions do stop short of actual vesicles, which Pattie²⁴ failed to determine. The one result which does require some attention is that of No. 12. The author reported, "I had not produced any evidence of tissue changes resembling a blister, though S had observed such." In fact the S had reported first, a red painful circle, followed by a blister within 35 min. of the suggestion. It is quite possible that some sort of edema, without tissue alteration actually did occur, producing a white anemic center surrounded by erythema. If this were the case, the author may have detected it, but failed to recognize its significance (the report was made from memory some 20 years after the "experiment"), or the overt symptoms

may have dissipated by the time the "experimenter" reached the S. Unfortunately, the controls in this "negative" report are as poor as the other "successful" cases.

Validity of the Effect

Table 2 summarizes the main possible alternative explanations covered above. In only three reported studies (No. 3, 8, and 11) can these alternatives be ruled out. These studies, as do the others, still suffer from a small, select number and lack of controls. In respect for professionals colleagues, it should be mentioned that several of the studies that have been criticized above were performed by dermatologists and many of these sources may have been controlled. In the absence of reported controls, however, we can only say that it is possible that their effects were genuine.

On the basis of the three remaining re-

TABLE 2. SUMMARY OF POSSIBLE CAUSES OF POSITIVE RESULTS EXCLUDING HYPNOTIC SUGGESTION

Experimenter	Alternative explanations*			
	Self-injury	Mechanical stimulation	Contact dermatitis	Mechanical edema
1. Focachon (1886)	P		PP	
2. Von Krafft-Ebbing (1889)	P	P	PP	
3. Jendrassick (1888)				
4. Rybalkin (1890)	P	P	PP	P
5. Doswald & Kreiback (1906)				
(a)	P	p		
(b)	P	p		
6. Heller & Schultz (1909)		P	PP	P
7. Podiapolski (1909) (a)		P	Pp	
		P	Pp	
8. Smimoff (1912) (a)				
(b)				
9. Wetterstrand (1915)		p		P
10. Hadfield 1917) (a)	P	p		P
(b)		p	P	P
11. Schindler (1927)				
12. Wells (1944)	P	P	P	
13. Ullman (1947)	P	P		
14. Borelli & Geertz (1953)	P	P	Pp	p

*P, highly probable; PP, from two sources; and p, possible.

ports (No. 3, 8, and 11), we must tentatively conclude that a positive skin reaction, bullae, or related skin anomaly, can be produced by hypnotic suggestion. The basis for this conclusion with studies No. 3 and 8 is based upon the fact that the reaction was not specifically at the point of stimulus contact, but rather seems to be the result of a bilateral reflex action (No. 3) and responses falling within a dermatome (No. 8), both of which exclude external cause as the sole agent. Report 11 is particularly significant because no stimulus object was used.

Since Pattie²⁴ objected so strongly to the idea of vasomotor control being influenced by the CNS, some additional survey of the literature was made to determine if analogous reactions of localized vasomotor activity had been produced. Barber⁹ reviews several studies which show responses such as swelling, bruising, wheals, etc. elicited with recall of a traumatic experience. Several reports have appeared recently which purport to control or "cure" various skin disorders by hypnosis. Sarbin²⁵ mentions improvement in 2 urticaria patients by hypnosis, after standard treatments had failed. Morton²² reports a case of "rash" which covered the patient's face and body. Using direct hypnotic suggestion, he claims to have limited the rash to the patient's hands, where "the exacerbation is easily controlled or eliminated via hypnosis." A clinical report by Lait¹⁶ on an 83-year-old female with a history of skin sensitivity to many local applications describes how two hemorrhage blebs, edema, and erythema were reduced within one week following direct hypnotic suggestion of relaxation of the muscles and vessels of the afflicted limb. A recent report by Hedge¹¹ claims "cures" of "well advanced arteriosclerosis" in various limbs by direct hypnotic suggestion of vasodilation. Weight is added to the above clinical reports by laboratory experiments of Menzies,¹⁹ in which vasoconstriction was conditioned in 12 of 14 Ss with a variety of conditioned

stimuli. Perhaps more important in demonstrating cerebral influence on vasomotor activity was an inquiry reported in the same paper, reporting evidence of conditioned vasoconstriction on recall of a visual stimulus in 3 or 4 Ss. In a later paper, Menzies²⁰ was able to condition vasoconstriction of the hand to a compound stimulus in 40 trials. He again reported inquiries in which Ss were instructed only to "image" specific past experiences. Of 5 Ss imaging extreme cold, a fall in skin temperature was noted in every case. Directly analogous to the blister studies were 5 of his Ss who were instructed to "image" extreme heat—e.g., steam escaping from a valve onto the hand. Of these 5 Ss, 3 were noted to increase skin temperature significantly on the localized areas in which they had previously experienced extreme heat.

We may conclude, as Gorton¹⁰ has, that vasomotor phenomena can be quantitatively influenced, not only by hypnotic suggestion, but by suggestion in the "waking" state, as well as autosuggestion in suitable Ss.

Subject Peculiarities

Almost every writer who has looked into this area has been impressed by a peculiar predisposition that Ss must possess in order to demonstrate overtly these "indirect voluntary controls." Bain² has called attention to the fact that the reaction threshold for dermatitis is lowered during certain emotional states, explaining this result as being due to an increase in perspiration. Edelburg,⁸ likewise, reports a fall in tactile threshold during an increase in autonomic activity, particularly when finger pulse volume is used as the index of autonomic activity. These studies suggest that the neurotic or hysterical character of the Ss used to demonstrate the various vasomotor reactions may be a necessary component. Further suggestion of an especial skin sensitivity may be taken from evidence which indicates that

the skin of individuals who recurrently are troubled with dermatitis contains more histamine than "normals."¹⁵ Cormia⁷ sheds additional light on the matter in his study of pruritus thresholds. He noticed that wheal and flare reactions followed closely on pruritus after injections of very dilute histamine phosphate solutions. Reactivity varied from solutions of 1:10,000 to 1:100,000. He found the thresholds were progressively lower for "normals" through varying degrees of neurotics. Of particular importance was the fact that not only were the thresholds lower on involved skin (dermatitis) than on normal skin of the same Ss, but that many Ss produced wheal and flare reactions at points of previous injection following "psychic trauma." "Psychic trauma" consisted of asking the Ss to think about specific disturbing situations, which had been obtained from their case histories. Cohen *et al.*⁶ also report several studies which demonstrate great specificity in autonomic responses, particularly peripheral vasomotor activity, which were believed to be mediated by CNS activity. The latter authors found a correlation between CNS activity and peripheral vasomotor activity, specifically detecting venoconstriction, mediated by the sympathetic system, which was activated by the presentation of "charged" words. They hypothesize the mechanism to be: charged words → ARAS activation → increased excitability of the posterior hypothalamus → venoconstriction.

Brunner⁵ reports that the rate of transudation in edema formation is greatly increased following "psychic trauma." He postulated that acetylcholine, liberated at the ends of cholinergic nerves, may have a synergetic effect with histamine. Cormia⁷ seems to have verified this hypothesis, in finding that very slight injections of mecholyl (an acetylcholine-like substance) greatly increased the formation of edema and wheal reactions. Since both andrenergic and cholinergic substances are increased by anxiety and

tension,²¹ the latter findings also give credence to a postulated necessity of a particular S-type, or S-state for demonstration of these phenomena.

Central Influence

In attempting to explain such vasomotor changes that have been shown to be a function of central activity, Sarbin²⁵ has hypothesized a shift in dominance from cortical to subcortical levels. In view of the findings of Cohen *et al.*,⁶ among others, this writer would prefer to leave the dominant control in the cortex, since suggestion and ideomotor action are seemingly, always involved. There seems to be little doubt that the anatomical structure of the brain contains the necessary circuits and pathways to allow such cortical influence on subcortical and brain stem structures.¹³ The effect of hypnosis would seem to be primarily, through decreasing the sensory influx, through the relaxation procedure, so that attention is focused only on the particular functions of present relevance. This same focusing would appear to be operative in cases of "waking" Ss who show localized vasomotor reactions.³ Gorton's analysis¹⁰ of EEG responses in hypnotized and "waking" Ss in terms of "psychological set" agrees with this proposition. Lastly, the work of Brunner⁵ Cormia,⁷ and Johnson *et al.*¹⁵ suggests that Sarbin's "prior pathological experience" or "organic readiness"²⁵ may in fact be a necessary component for the evocation of such vasomotor phenomena, whether viewed in terms of conditioned responses whose cues are stored subcortically¹² or in terms of a lower localized threshold.⁷

In conclusion, a quote from William James on ideomotor action seems inclusive: "The fact is that there is no sort of consciousness whatever, be it sensation, feeling, or idea, which does not directly and of itself tend to discharge into some motor effect."¹⁴

Summary

A survey of the literature to 1962, has revealed 21 reported attempts to produce nonherpetic skin blisters by hypnotic suggestion. Of these 21 reports, only 14 were found to be at all satisfactory in accounting for their methodology, procedures, and controls. Even these "experiments" were found to suffer from poor experimental designs, a small select population, and gross lack of controls, both in control Ss and experimental controls. Three of these reports were sufficiently free of alternative explanations for positive skin reactions to conclude that skin anomalies had been produced by suggestion. Several additional studies on psychogenic vascular changes were reported which add credence to the possibility of central control of these phenomena. It was tentatively concluded that the anatomy and physiology of the nervous system possess the necessary characteristics for such reactions to occur, but that certain idiosyncratic predispositions of the Ss may be a necessary component to demonstrate such phenomena. The reactions do not appear to be limited only to hypnotized Ss; however, all results to date can be viewed only as pilot studies. In this area, as in so many others, the well-controlled, carefully reported, parametric study is still waiting to be done.

University of Illinois
Dept. of Psychology
Psychological Clinic
Urbana, Ill.

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Sixth European Conference on Psychosomatic Research

The sixth European Conference on Psychosomatic Research will take place in Athens, Greece on May 6-8, 1964. Main topics of the conference will be (1) Psychosomatic Aspects of Heart Disease; (2) Gynecological Problems (Frigidity-Sterility-Painless Childbirth) and their Psychosomatic Approach; and (3) Skin diseases from the Psychosomatic Standpoint.

A section for the presentation of papers on topics other than these will also be arranged. The official language of the Conference will be English but a speaker may speak in French or German if his paper, translated into English, is available for all the congress members.

Address all correspondence to GEORGE S. PHILIPPOPOULOS, M.D., 4 Monis Petraki Street, Athens (140), Greece.