wounds projected upon the same cardboard in order to obtain their surface in square centimeters.

This simple method provides a means by objective measurements to make evident changes in the surface of wounds that are not apparent to the naked eye. Figure 1 shows the observations recorded with this method in a man of 42 years of age with hemiplegia and a decubital ulcer over the right buttock. The clinicians who had observed this wound daily had not noticed any remarkable change; however, it is quite obvious that the wound grew larger each time the treatment was changed, and that the use of an antibiotic was followed by a particularly striking enlargement of the lesion. In this instance the procedure of projection and gravimetric planimetry was repeated by different operators and a variation of ±5% was found (indicated by a cross-hatched area on Fig. 1).

Figure 2 shows the same type of observation in a woman with hemiplegia and a decubital ulcer. This patient died from septicemia, and the decubital ulcer worsened with the general condition of the patient.

A method of gravimetric planimetry by standard photographs offers a means to study the course of surface wounds more accurately than by clinical observation or by the pictorial record alone.

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Regularly Occurring Periods of Eye Motility, and Concomitant Phenomena, During Sleep

Eugene Aserinsky and Nathaniel Kleitman
Department of Physiology, University of Chicago, Chicago, Illinois

Slow, rolling or pendular eye movements such as have been observed in sleeping children or adults by Pietrusky (1), De Toni (2), Fuchs and Wu (3), and Andreev (4), and in sleep and anesthesia by Burford (5) have also been noted by us. However, this report deals with a different type of eye movement—rapid, jerky, and binocularly symmetrical—which was briefly described elsewhere (6).

The eye movements were recorded quantitatively as electrooculograms by employing one pair of leads on the superior and inferior orbital ridges of one eye to detect changes of the corneo-retinal potential in a vertical plane, and another pair of leads on the internal and external canthi of the same eye to pick up mainly the horizontal component of eye movement. The potentials were led into a Grass Electroencephalograph with the EOG1 channels set at the longest time constant. Brain waves, lid and jaw muscle activity, and electrode movement introduced superfluous potentials which severely hindered the identification of eye movement potentials. To eliminate this difficulty, a monopolar recording was made simultaneously from the frontal area (and occasionally from the anterior temporal area) to be compared with the bipolarly recorded electrooculogram. In this way, the eye movement potential could be recognized easily as a wave in phase on the monopolar and bipolar recordings, but with a potential from 2 to 4 times greater on the latter recording. Note that the gain settings (Fig. 1) for the bipolar recording (RV) and monopolar recording (RF) were adjusted so that an equal excursion of both pens signified that the bipolar potential was actually 4 times greater than the monopolar potential. The criteria for identification of eye movement was confirmed by direct observation of several subjects under both weak and gradually intensified illumination. Under the latter condition, motion pictures were taken of 2 subjects without awakening them, thereby further confirming the validity of our recording method and also the synchronicity of eye movements.

Twenty normal adult subjects were employed in several series of experiments although not all the subjects were involved in each series. To confirm the conjecture that this particular eye activity was associated with dreaming, 10 sleeping individuals in 14 experiments were awakened and interrogated during the occurrence of this eye motility and also after a period of at least 30 min to 3 hr of ocular quiescence. The period of ocular inactivity was selected on the basis of the EEG pattern to represent, as closely as possible, a depth of sleep comparable to that present during ocular motility. Of 27 interrogations during ocular motility, 20 revealed detailed dreams usually involving visual imagery; the replies to the remaining 7 queries included complete failure of recall, or else, "the feeling of having dreamed," but with inability to

9 Electrooculogram.

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recollect any detail of the dream. Of 23 interrogations
during ocular inactivity, 19 disclosed complete failure
of recall, while the remaining 4 were evenly divided
into the other 2 categories. Recognizing the inade-
quacies of employing a χ² test for the independence
of the 2 groups of interrogations, the probability
nevertheless on a χ² basis is that the ability to recall dreams
is significantly associated with the presence of the eye
movements noted, with a p value of less than 0.01.

 Eleven subjects in one series of 16 experiments
were permitted to sleep uninterrupted throughout
the night. The mean duration of sleep was 7 hr. The
first appearance of a pattern of rapid, jerky eye
movements was from 1 hr 40 min to 4 hr 50 min (3
hr 14 min, mean) after going to bed. This pattern of
eye motility was of variable duration and frequently
disappeared for a fraction of a minute or for several
minutes only to reappear and disappear a number of
times. The period from the onset of the first recog-
nizable pattern to the disappearance of the last pat-
tern was from 6 to 53 min with a mean of 20 min. A
second period of eye movement patterns appeared
from 1 hr 10 min to 3 hr 50 min (2 hr 16 min, mean)
after the onset of the first eye motility period. With
lengthier sleep there occurred a third and, rarely, a
fourth such period. The electrooculogram disclosed
vivid potentials with amplitudes as high as 300–400
μV, each potential lasting about 1 sec. This was fur-
ther striking in comparison with simultaneously re-
corded monopolar EEG's, from the frontal and oc-
cipital areas, which were invariably of low amplitude
(5–30 μV) and irregular frequency (15–20/sec and
5–8/sec predominating).

 In another series of experiments involving 14 sub-
jects, the respiratory rate was calculated for a mini-
mum of 1/2 min during eye motility and compared
with the rate for a similar duration 15 min before and
after an eye motility period. The respiratory rate had
a mean of 16.9/min during eye motility in contrast
with 13.4/min during ocular quiescence. By using
Fisher's t method, the difference in rates was found to
be statistically significant with a probability of less
than 0.001. Experiments now in progress suggest that
heart rate also is probably higher in the presence of
these eye movements. Body motility records were
secured in 6 experiments by attaching a sensitive
crystal to the bed spring and leading the output
through a resistance to a Grass preamplifier. In every
case the eye motility periods were associated with
peaks of overt bodily activity although the latter were
frequently present in the absence of eye movements.

 Data obtained from the 2 female subjects used in
these experiments were at least qualitatively similar
to that obtained from males.

 The fact that these eye movements, EEG pattern,
and autonomic nervous system activity are signifi-
cantly related and do not occur randomly suggests
that these physiological phenomena, and probably
dreaming, are very likely all manifestations of a par-
ticular level of cortical activity which is en-
countered normally during sleep. An eye movement
period first appears about 3 hr after going to sleep,
recurs 2 hr later, and then emerges at somewhat closer
intervals a third or fourth time shortly prior to
awakening. This method furnishes the means of
determining the incidence and duration of periods of
dreaming.

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Inactivating Medium for Hexachlorophene
(G-11) Types of Compounds and Some
Substituted Phenolic Disinfectants

A. L. Erladson, Jr., and C. A. Lawrence

Department of Bacteriology,
University of Michigan, Ann Arbor

A previous report presented evidence of the use of
synthetic, nonionic wetting agents for the inactiva-
tion of the bacteriostatic activity of hexachlorophe-
ne (G-11) upon bacteria (1). With the evidence obtained
of the marked interfering action of Tween-802 on
the bacteriostatic effects of hexachlorophene, it appeared
desirable to extend these studies to several other chem-
ical disinfectants, two of which are closely related in
chemical constitution to hexachlorophene, G-4 (2,2'-
dihydroxy-5,5'-dichlorodiphenylmethane) and Act-
amer (2,2'-dihydroxy-3,5,5'-tetachlorodiphenyl sul-
fluence). In addition to the latter, several substituted
phenolics and related compounds were evaluated in
the presence and absence of the nonionic surface-
active agent. The compounds studied and their chem-
ical designations are given in Table 1.

 Due to the relative insolubilities of several of the
compounds in distilled water (Nos. 1–8) these were
first dissolved in 1 ml of 10% sodium hydroxide and
then diluted to 1.0% with distilled water. The re-
main ing disinfectants were dissolved directly in dis-
stilled water or in beef extract broth (0.3% Bacto beef
eextrct, 1% Bacto peptone, 0.5% sodium chloride in
water). In all instances 9 ml of sterile broth, with or
without 1% Tween-80, were added aseptically to the
first of a series of sterile test tubes and 5-ml amounts
in the remaining, or 9 additional tubes. To the first
tube was added 1 ml of the stock germicide to be
tested. After thoroughly mixing the latter in the
medium, 5 ml was transferred to the second tube con-
taining 5 ml of broth. This process of mixing and
transferring was then continued through the remain-

1 Present address, Los Angeles County Health Department,
Calif.
2 Atlas Powder Company, Delaware, brand of polyoxyalkyl-
en derivative of sorbitan monoooleate.
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