PSYCHOLOGY

Your Ears and Nose Help You to See

Scientific Tests Show That a Whiff of Citronella, Or the Sound of a Whistle, Makes the Sight Keener

By MARJORIE VAN DE WATER

DO YOU READ these words with your eyes alone, or do your ears, your nose, your tongue, and the senses of your skin all lend their aid?

Of course, you cannot taste a newspaper or a book except in a figurative sense, but what you do taste may give a different appearance as well as flavor to the page before you.

All of which is a rather complicated way of saying that there may be a great deal more cooperation between the different senses than has been realized in the past. This fact has been revealed by recent experiments conducted in Berlin by an American psychologist Dr. George W. Hartmann, of Pennsylvania State College.

Now it appears that there may be good scientific foundation for the old custom of pinching oneself to make sure of the reality of what is seen. Perhaps too, the stenographer who chews gum is really aided by it in her effort to hear her employer's dictation.

The beautiful play of colors which accompanies orchestral selections in many theaters may not only delight the eye, but also make the music sound more lovely. And the bright color of the rose may intensify your pleasure in its scent.

Not that Dr. Hartmann's experiments were conducted in the theater or the garden. On the contrary, it was in a quiet laboratory darkroom that he found that some sort of connection exists between the senses.

A whiff of odor from a bottle of that mosquito chaser, oil of citronella, will make your sight keener, he found. So also will the very disagreeable odor of xylenol which smells rather like coal tar or strong disinfectant. And the sound of a whistle, the pressure of a hammer against your hand, or the pain of a pin prick.

You may or may not be aware that your sight is improved by these signals to your other senses. Some of those who took part in the experiment were conscious of the improvement; others complained that the "distractions" or annoyances kept them from doing their best. But the test results told the same story of greater keenness of vision, quite regardless of what the individual thought he was accomplishing.

The test consisted of two little black squares placed in the center of a white cardboard. These squares could be manipulated from where the experimenter sat, out of sight of the subject behind the cardboard. They could be placed so close together that at the distance of about twenty feet away, the subject being tested could not even see the crack between them. They would look like one rectangle. Then the experimenter would move them apart, very, very gradually until they appeared as two distinct squares to the subject. The smallest crack which makes them seen as two, not one, was considered as the measure of the keenness of sight.

When this amount, which psychologists call the "threshold," was definitely established under "normal" conditions, then the sounds and smells, and so on, were brought into the picture. First a shrill, high-pitched whistle was blown while the person tested was trying to decide at what point the squares seemed to separate.

Sees Better During Blast

Now a strange thing happened. Where the subject had been able to see only an apparently undivided rectangle, the blast of the whistle made him see two distinct squares.

"The tone jarred the two squares apart so that a better defined crevice appeared in the center," one man reported.

Another observer said that after the whistle ceased, the split between the squares also vanished. Some said that they felt more tense during the time the whistle was blowing. One claimed that his concentration was better during the time the shriek was in his ear, but another insisted that he worked better without the "distraction." The scale which showed the actual distance detected, however, uninfluenced as it was by the unpleasantness of the sound, showed that the sound was not a hindrance but an aid to the vision. And this despite the opinion of the observer.

COOPERATING SENSES

When an odor sends its signal to the olfactory center of the brain, or a noise to the auditory center, your vision is improved. Dr. Hartmann believes this is due to a transfer of energy between the centers.

Perhaps you would like to try the experiment yourself. It may not be possible for you to secure the use of darkroom and the apparatus for adjusting the distance between the squares, but still you can get a rough idea of what the experience is like by pasting up a series of squares various distances apart. Use black paper—the construction paper used by school children in the lower grades is very good for the purpose—cut squares three centimeters on each side (1 3/16 inches), and paste these on white paper. Better have one pair about an eighth of an inch apart, the next a little closer, and so on until your last pair are touching.

Now set the squares upon some sort of rack about twenty feet away from your eyes. You should look at them through one eye. And the observers in the original experiment also took the precaution of looking through a pinhole so that the dilation of the pupil of

the eye would not make the test easier for some individuals.

What do you see? Probably some are quite distinctly two squares. Others look exactly as though they had magically run together. But another group probably are not clearly either two or one. They may appear fuzzy down the middle, or they may be uncertain—now two, now one. It is in this latter group that you are most likely to notice a difference when you hear the high-pitched sound, or smell the "loud" smell.

And here is another even more interesting experiment that you can easily try out in your own living room:

The materials you need are only a bright colored piece of paper—very bright green is probably best—a sheet of neutral gray paper and a tuning fork.

First stare at the bright spot of paper without moving your eyes for about a minute. Gradually you will notice that the edges become fuzzy and have a sort of pinkish halo—that is, it will be pinkish if your paper is green. If you chose a red patch, the color around the edge will be green. But keep looking until the minute is up. Then slip the gray sheet over the green and look at it steadily for a moment.

What do you see now? If you have not tried this stunt before you may be surprised at how bright and real the red patch is. Wait until it just begins to fade and then set the tuning fork to vibrating and bring it close to your ear. You will probably find that the image brightens perceptibly. Now move the fork away, and see what happens.

Many who tried it, found that unaccountably when the fork was moved out of hearing the image vanished with it. Sometimes bringing the fork back will restore the image; sometimes it is gone for good.

For a few, the fork did not seem to brighten the image but caused it to wave or flicker in tune with the vibrations of the fork.

The amount of improvement in vision brought about by the sounds and smells and hammer blows is, of course, very slight. It is, however, sufficiently consistent to point definitely to one fact —there is apparently some connection between the senses.

"Apparently, lights, sounds, smells, pressures, and pains do have some property or properties in common, for how otherwise would one account for their similar influence upon visual acuity?" Dr. Hartmann said.

Sounds Having Color

And there is an exchange of energy between the different centers of the brain, Dr. Hartmann is convinced as a result of his experiments. The activity of any one sense organ does not remain confined in that organ, he says, but spreads, although in lesser degree over all the other sense centers.

It is not that your eyes respond to sound waves, or to odors. But when your ear receives the sound and transmits it to the auditory centers of the brain, its duty is not yet done. The nervous impulses which carry the sound also excite other centers of the brain. When the visual centers receive these impulses, they are interpreted by you as coming by way of the eye—what you see seems brighter, sharper, clearer.

In some individuals, the senses are very intimately related so that sounds to them have color, of even taste.

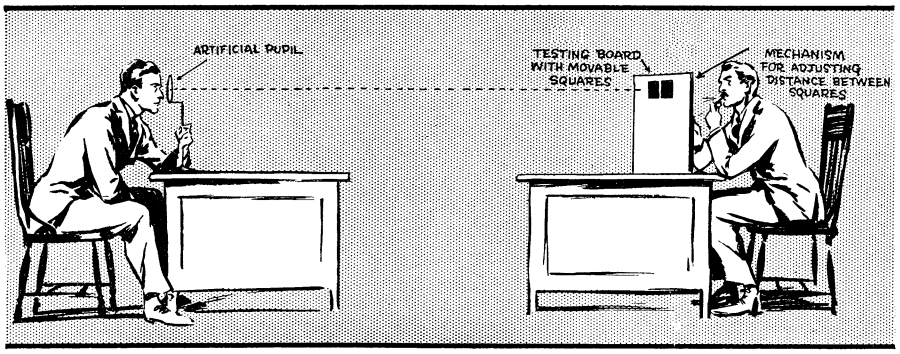
Sir Francis Galton, noted anthropologist who was largely responsible for our system of using fingerprints to detect and identify criminals, was one of these persons. To him, many sounds had definite colors.

"The vowels of the English language always appear to me, when I think of them, as possessing certain color," he said. "Consonants, when thought of by themselves, are of a purplish black; but when I think of a whole word, the colour of the consonants tends towards the color of the vowels. For example, in the word 'Tuesday,' when I think of each letter separately, the consonants are a purplish-black, u is a light dove color, e is a pale emerald green, and a is yellow; but when I think of the whole word together, the first part is a light gray-green, and the latter part yellow. Each word is a distinct whole."

A new school of German psychologists, called the Gestalt school from the German word which means pattern, teaches that an individual does not have single experiences or sensations by themselves. You respond not to red or yellow or tree or cloud, each by itself, but rather to the whole environment as a pattern.

His experiments, Dr. Hartmann believes, add new evidence to the argument of this school. Not only do you see what lies before your eyes as one great pattern, but woven into the design are also the myriad sounds which assail your ears, the perfumes which reach your nose, and the pressures and pains which make the scene smooth and soft or harsh and grating.

Science News Letter, February 11, 1933



IN THE MIDST OF AN EXPERIMENT

The man at the left, looking through an "artificial pupil," a pinhole in a cardboard, keeps his vision on the two black squares manipulated by the man at the right.

METEOROLOGY

Midwinter Rainbow Seen Due North

UNUSUAL among meteorological phenomena, a rainbow in the northern sky was observed by Prof. Edwin L. Moseley of Bowling Green State College, Ohio.

Rainbows are seen when the sun, usually low in the sky, shines upon a curtain of raindrops opposite it in the heavens, the drops returning the split-up light to the eye of the observer by a double internal reflection. In summer the noonday sun often shines upon rain in the northern sky, but it is too high to form a rainbow. In winter the noon sun is low enough to form a bow, but if there is any water in the air it is frozen and hence unable to reflect the light properly and to break it up into the rainbow colors. It is only when a very mild winter brings rain when the sun is low enough that this unusual sight of a north-sky rainbow can be seen.

Science News Letter, February 11, 1933