

many workers in many lands have been at it for years. Some of them have claimed success in discovering cycles of returning weather of the same type, ranging from a few days to several centuries. J. B. Kincer, who has carried on a good deal of original investigation on his own account in this particular field, is directing the cycle investigation for the Weather Bureau.

Weather correlation studies are based on the obvious fact that weather does not come in separate pieces, like stones in a mosaic, but as a flowing continuity, like paints in a picture. Each kind of weather ties in with the neighboring kind, in a world-wide web of mutual influences. It has been claimed, especially by British scientists in India, that places far apart, like India and Australia, have definitely traceable connections with each other's weather. U. S. Weather Bureau scientists are also looking into this work, on which a considerable mass of data has been accumulated.

The planets are so remote from the earth that a connection between their positions and weather on the earth would at first seem downright fantastic—almost smacking of astrology. Yet when Henry Wallace and his colleague Larry Page some years ago made a statistical study, they found an apparent correlation between weather and the positions of the major planets, especially Jupiter. When Jupiter, earth and sun were all on or near the same straight line in space, certain conditions prevailed; when Jupiter was around on the opposite side of the sun, the weather was "opposite," too.

Planets Repel Spots

At the time, Mr. Wallace offered no positive explanation, except a suggestion of influence due to the gravitational pull of Jupiter, which is a thousand times as massive as the earth. But within the past few weeks Dr. Fernando Sanford of Palo Alto, Calif., has stated that three other planets, Mercury, Venus, and our own earth, apparently chase the sunspots around to the opposite side of the sun—and sunspots have persistently figured in all kinds of weather-influence studies. Dr. Sanford suggests that this sunspot-repelling effect may be due to like electrical charges on the sun and the planets. If this is true of these three planets, possibly the other planets may have a similar influence.

This planetary-influence hypothesis is still very much up in the air; for Messrs. Wallace and Page did not carry their investigation beyond the weather at one

station—Des Moines, Iowa—and the whole problem has been lying dormant for several years. Now, however, it is being dusted off and will have to go through the mill of re-examination, extension to other stations, and careful scientific criticism.

Ocean temperature correlations are also on the books for study. This work was pioneered in this country by Dr. George E. McEwen of the Scripps Institution of Oceanography, who for a number of years has based quite successful seasonal forecasts for southern California on the ocean temperatures off the coast during the summer months. The U. S. Weather Bureau has undertaken the same kind of studies for the Gulf and Caribbean areas, under the leadership of Giles Slocum. Steamship and airline companies are cooperating enthusiastically.

PSYCHOLOGY-PHYSIOLOGY

Hearing Apparatus Sets Own Limit on Pitch and Loudness

A NEW explanation of why hearing for deep tones falls off so rapidly as the pitch is decreased below the lowest notes of ordinary musical instruments was presented to scientists at the meeting of the American Psychological Association. Dr. Ernest Glen Wever and Dr. C. W. Bray, research team of Princeton University, famous for first "listening in" by telephone on the hearing apparatus of an animal, reported new findings from experiments conducted in collaboration with Dr. C. F. Willey.

Tapping the electric responses in the ear, this time of a guinea pig, the investigators studied what happened when tones of 5 to 60 cycles were sounded. The hearing of tones below 15 cycles is distorted; the overtones are greatly favored relative to the fundamental tone. It was also found that for these low tones there may be more than one volley of nerve impulses per cycle.

If, as these scientists have concluded from previous experiments, the perception of pitch, of low tones at least, depends upon the frequency of the volleys of nerve impulses, these extra volleys in the case of the low tones would make them appear higher in pitch and automatically place a lower limit upon perceived pitches.

The hearing apparatus also sets its

own limit upon the loudness of sounds which it is possible to perceive, it appears from this same investigation. The results show that for any given tone, the maximum response of the ear's cochlea may be reached at an intensity below that which causes any harm to the ear. It is not pain or actual damage to the ear that sets the limit to the intensity of sounds that we can "take in;" that limit is set by the mechanism of hearing itself, the investigators concluded.

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ASTRONOMY

Model of Moon Displayed At the Franklin Institute

See Front Cover

LENDING charm to the scientific model of the moon built by her father, little five-months-old Verne Carlin Spitz posed as the "Baby in the Moon" for the photograph on the front cover of this week's SCIENCE NEWS LETTER.

The model, constructed by Armand N. Spitz of Newtown Square, Pa., is intended to show the phases of the moon as seen through a powerful telescope. It will be demonstrated during this month at Franklin Institute.

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