MODERN WATCH TIMING

A number of electric watch timers developed by Bell Telephone Laboratories have gone into service to do a ten-day regulating job in ten minutes. (SNL, May 27, '33, p. 325.) Correct time intervals furnished by wire from a constant frequency generator flash a lamp upon a mirror that reflects the image of the balance wheel. The wheel appears to remain stationary when the watch is running accurately.

ENDOCRINOLOGY

Energy of Dickens Due To Glandular Balance

FOR THE tremendous literary output of Charles Dickens, in many volumes treasured in literary households, including his "Life of Christ" now receiving first publication, we have to thank the excellent balance of his glandular system and the dominance of those glands which produce unusual energy, in the opinion of Dr. H. B. Fantham, Canadian biologist of McGill University, Montreal, who discusses the subject in the international journal, *Character and Personality.*

"The vigor, energy, persistence, and sympathy of Charles Dickens may be said to be due to good balance between his pituitary, adrenal, and thyroid glands, with the two latter, however, dominating," Dr. Fantham said.

"The influence on Charles Dickens of other glands of internal secretion such as the thymus, the gonads, and possibly the pineal, are not easy of estimation from the data available."

This diagnosis was based on records of Dickens' life, habits, and personality, descriptions of his physical appearance and his portraits.

Science News Letter, March 17, 1934

RADIO

Soviet Scientists Find Radio Roof Higher in Polar Regions

Hence Long Waves Travel Farther at Ends of Earth; Reflecting Surface Rough, Shielded by Radio "Clouds"

THE "RADIO ROOF" of the atmosphere, that electrified layer which reflects radio waves and makes possible long distance transmission, is higher in polar regions than in temperate latitudes, Prof. M. A. Bontch-Bruewitch, Soviet scientist, revealed in a report to *Nature.*

Experimenting at Murmansk, in the extreme northwestern portion of the U.S.S.R. near the Arctic Ocean, Prof. Bontch-Bruewitch discovered many unusual phenomena in connection with the fading of radio signals.

The height of the radio reflecting layer is ordinarily measured by sending radio signals and recording their reception on an oscillogram. If the receiver is within a short distance of the transmitter, two signals will come in, one direct from the ground wave and the other reflected by the radio roof as light is from a mirror. The time interval between the original signal and the echo gives an index to the height of the reflecting layer.

Two reflecting layers were found by the Soviet scientist in the polar regions, corresponding to the two layers found in England by Prof. E. V. Appleton, but the lower layer, known as the E layer, is not generally active so far north.

This means that at the ends of the earth, long wave radio signals ordinarily reflected by this lower layer will penetrate to the higher or F layer and hence travel greater distances than in temperate latitudes.

Very complex reflections from the upper region indicate that this part of the ionosphere has a stratified or undulatory structure, Prof. Bontch-Bruewitch reported.

Evidence was also found of radio-absorbing "clouds" or separate moving masses which pass along the radio-reflecting layer and prevent its reflection, as a cloud passing over the face of the moon prevents its light from reaching us.

When these radio "clouds" were present, the echoes were entirely absent for a short time. Such clouds make up an absorbing layer, independent of the reflecting layers and comparatively low in height, probably less than 65 kilometers (37 miles) as compared with heights of the reflecting layers ranging on the average from 110 kilometers (68 miles) to 220 kilometers (136 miles) or higher.

There is undoubtedly direct connection between the echo cessation and magnetic activity, Prof. Bontch-Bruewitch believes.

"The difficulty caused by magnetic storms of maintaining continuous wireless communication over high latitudes may be attributed to the existence of the absorbing layer," he concluded.

His research was conducted in connection with the International Polar Year and was organized by the Leningrad Section of the Institute for Scientific Research of the People's Commissariat for Communication in association with the Central Geophysical Observatory.

Science News Letter, March 17, 1934

PLANT PHYSIOLOGY

Movies Show Cells "Running Backwards"

STRONG light sometimes makes plant cells run backwards. This was demonstrated before the American Society of Plant Physiologists by Dr. Joseph C. Ireland of Oklahoma A. and M. College, with motion pictures taken through a microscope.

The pictures showed the streaming motion of the protoplasm in cells of the common water plant *Elodea.* This motion normally goes clockwise, carrying with it the lens-shaped bodies of coloring matter, the plastids. But exposure to strong light sometimes caused a reversal of direction. The films also showed how degeneration and death ensue when the too-strong light was too long continued.

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