

## Moisture Variation Indices of Soils in Relation to their other Physical Properties.\*

By M. S. Katti, B.Sc.

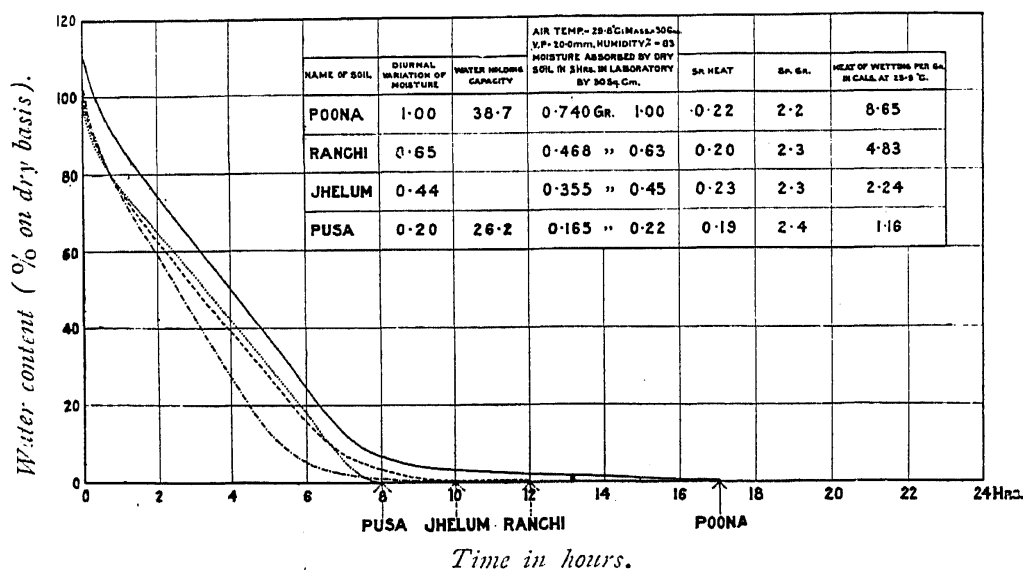
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IN two recent papers<sup>1,2</sup> it was shown that during the clear season when the surface soil contains only hygroscopic moisture, there is a regular diurnal exchange of moisture between the soil and the air. Later,<sup>3</sup> it was observed that this variation of moisture content in the soil is a definite characteristic or "index" of that soil. It is interesting to study the "moisture-variation-index" in relation to other important physical properties of the soil (see Fig.).

The sequence of the moisture variation indices of different soils as observed in the open is practically the same as that of their power to absorb water vapour when exposed under known conditions of temperature and humidity in the laboratory. The water-holding capacities of a few soils (expressed on air-dry basis) are given below :—

The values of the heat of wetting at 25.9° C. for different soils run parallel to those of moisture-variation-index, being large for the black cotton soils and small for the alluvial soils.

In determining the moisture content of a soil, the sample is usually kept in the steam oven "till the weight becomes constant". An exact study of the rate of drying in a steam oven is very instructive. The weight-time curves (see Fig.) for four typical soils starting with about 100% water (on dry basis) not only show the time for complete drying but also the rate of drying at different moisture contents. The times taken by different soils for attaining a steady minimum weight at 100° C. are in the same order as their moisture-variation-indices.



Soil	Water-holding capacity
Poona .. .. .	38.7 %
Sholapur .. .. .	40.9 "
Hagari .. .. .	30.9 "
Bangalore .. .. .	24.0 "
Pusa .. .. .	26.2 "
Lyallpur .. .. .	22.8 "

The black cotton group of soils is able to retain 15% more of water than the alluvial group.

The similarity in the behaviour of a number of physical properties of different soils to their moisture-variation-indices is striking.

The above work was done under the guidance of Dr. L. A. Ramdas, Agricultural Meteorologist, Poona.

<sup>1</sup> Ramdas, L. A., and Katti, M. S., *Indian J. Agric. Sci.*, 1934, 4, 923-37.

<sup>2</sup> Ramdas, L. A., and Katti, M. S., *Curr. Sci.*, 1934, 3, 24-25.

<sup>3</sup> Ramdas L. A., and Katti, M. S., *Curr. Sci.*, 1935, 3, 612-13.

\* Presented at the Colloquium, Meteorological Office, Poona, on 26-11-1935.

## Obituary.

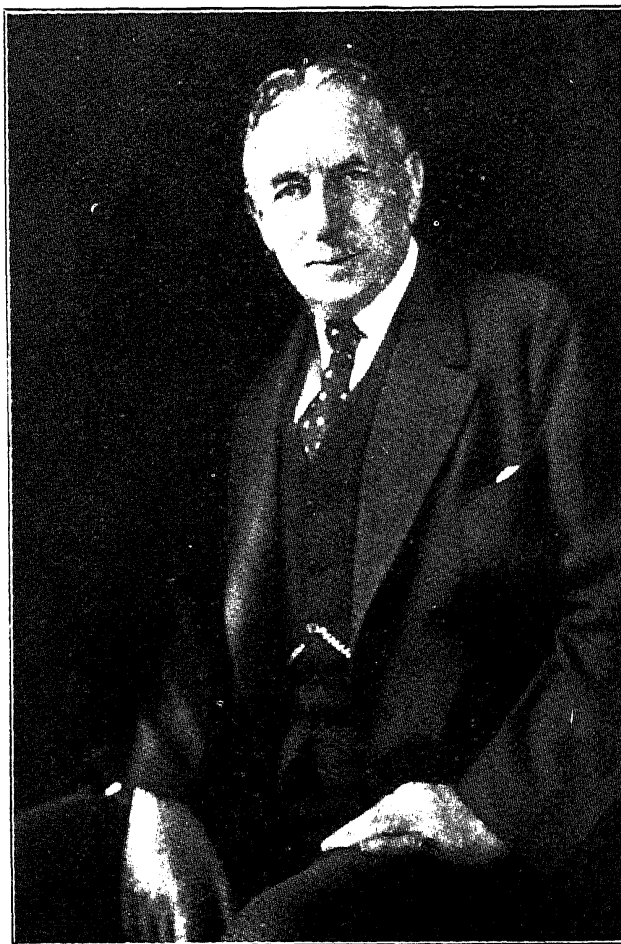
Henry Fairfield Osborn (1857-1935).

THE sad death of Henry Fairfield Osborn, Zoologist, Palæontologist, Educationist, Author and Administrator, at the age of 78, has created a gap among the American men of Science which it would be hard to fill. President Osborn—as he was generally known in America since he became the President of the Board of Trustees of the American Museum of Natural History in 1903 after the death of President Jesup—made very valuable contributions to the sciences of Zoology, Palæontology and Biology; a great deal of his Zoological and Palæontological work was essentially biological, in that it contributed to an understanding of the nature, continuance and evolution of life. In addition, his services to the cause of Education and his work as an administrator and author, are so remarkable that any of them would have won him an outstanding place amongst the leading workers of the times. Osborn was born on the 8th of August 1857. His father, William Henry Osborn, was a Founder and for many years President of the Illinois Central Railroad, and from him apparently young Osborn inherited his great administrative talents. He was educated in the Columbia Grammar

School and Lyons Collegiate Institute of the New York City, and later graduated at Princeton College where he was strongly influenced by the teachings of the well-known Geologist Professor Arnold Guyot. Taking up practical field work in the Museum of Geology and Archæology at Princeton soon after his graduation, he became the leader of the palæontological section of the University Expeditions to Colorado and Wyoming in 1877 and 1878. In 1878-79 he took courses in Anatomy and Histology at the College of

Physicians and Surgeons in New York, and in 1879-80 went to Europe, where he studied Embryology at Cambridge under Professor Francis Balfour and Comparative Anatomy in London under Professor Thomas Henry Huxley. He later spent some time at Coburg, Germany, learning German. In 1881 he was appointed as the Assistant Professor of Natural Science at Princeton, and in 1883 as the Professor of Comparative Anatomy; this latter post he held till 1890. In 1891 he was invited to occupy the De Costa Chair of Biology of the Columbia

University for organising the Zoological Department of the University. He selected the first officers of the department and was responsible for the planning of the teaching and research work in Zoology in this institution. During this period he started the well-known Columbia Biological series of publications and was also responsible for the starting of a University Press at Columbia which has done such useful work in the cause of education. From 1892-95 he served as the Dean of the Faculty of Pure Science of the University. In 1910 he retired from active teaching at Columbia, but up to his death retained his connection with the



Henry Fairfield Osborn.

University as the Research Professor of Zoology.

From 1891-1910 Professor Osborn, in addition, carried on active work as the Curator of the Department of Vertebrate Palæontology at the American Museum of Natural History. In 1910 he retired from the Curatorship of this section, but he continued to act as the Curator-in-chief not only of this division but also of the divisions of Mineralogy, Geology, Geography and Astronomy. In addition to being a trustee