

should show only a slightly greater latitude effect than at sea-level up to the heights corresponding to a pressure of 100 millibars. The difference in the geometry of the counter telescopes used by the different authors and the statistical accuracy of the results do not yet permit a quantitative comparison.

A detailed report of this work together with other results will be published shortly elsewhere.

It is with pleasure that we express our gratitude to Col. M. C. Robinson, Commanding Officer of the 84th Air Depot of the U.S.A. Air Force, for giving the permission for the flight, and also to Major G. Denis, Capt. J. Claunch, Lt. Mack, and Sgt. Beaver, under him, for their whole-hearted co-operation.

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April 10, 1945.

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EFFECT OF THE RATE OF TRICKLE ON THE MASS OF THE DROP

In determining the surface tension of a liquid by the drop weight method it is necessary that the drops should be formed sufficiently slowly so that the conditions at the time of separation of each drop from the nozzle of the tube are truly static or very nearly so. The rate of formation of drops in Lord Rayleigh's¹ experiments was about a drop per minute, while Edser² and Worsnop and Flint³ recommend a rate even as high as 60 drops per minute. An interesting point was revealed when actually an experiment was performed to bring out the effect of the rate of trickle on the mass of the drops formed. The results (Fig. 1) show that for small rates of trickle, the mass of the drop increases very slowly, but for larger rates it increases very rapidly to large values when the discrete drops are about to merge into a continuous jet.

A drop separates from the main bulk of the liquid at the nozzle when its weight just exceeds the pull due to Surface Tension. With increasing rate of trickle the liquid rushes out with an acceleration; this effectively reduces the weight of the drop and the drop grows to larger dimensions till the effective weight pulls it down. According to Lord Rayleigh for static conditions (i.e., rate of trickle $n = 0$) $m_0 g = 3 \cdot 8 r T$ where m_0 is the weight of the drop when $n = 0$; r is the external radius of the capillary orifice and T is the surface tension of the liquid. If " a " represents the equivalent acceleration of the liquid when the rate of

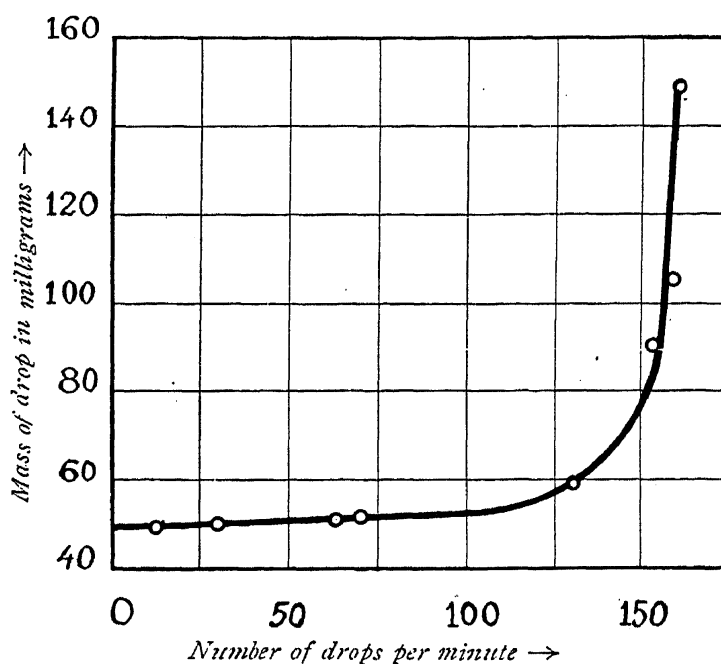


FIG. 1. Variation of the mass of drop with the rate of trickle

trickle is n drops per minute and m is the corresponding mass of the drop, we may write $m(g - a) = 3 \cdot 8 r T = m_0 g \therefore m \left(1 - \frac{a}{g} \right) = m_0$.

Now the acceleration " a " depends on " n " the rate of trickle. Therefore we write $m[1 - f(n)] = m_0$ where $f(n) = 0$, when $n = 0$. Since the experimental curve is nearly a rectangular hyperbola $f(n)$ probably has the form kn^x where k and x are constants.

In order to confirm the above explanation qualitatively experiments were carried out using strong electric fields to aid the acceleration of gravity. The drops actually separate out at an earlier stage of growth than when such an aiding force is absent.

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OCCURRENCE OF FLUORSPAR NEAR MALHAN, JUBBALPUR DT., C.P.

THIS note reports the occurrence of a workable deposit of fluorite near Malhan (N. $80^\circ 31'$; E. $23^\circ 40'$), in the Jubbulpur District, C.P. The place is about 7 miles S.W. of Rupaund Railway Station on the Katni-Bilaspur branch of B.N.R. The country rock consists of dolomite with intercalations of slate and chlorite schists of Dharwar age. The strike varies from E.-W. to N.W.-S.E. and the dip is northwards varying from 30° to 90° . The dolomite is often found to be intruded by quartz veins which vary in width from 4' to $\frac{1}{2}$ ". There are also basic dyke rocks intruded into the country rock.

Fluorite occurs only in pockets in the dolomite. There are no regular veins or zones which can be traced for some distance. Galena, chalcopyrites, malachite, barytes and calcite are associated. Quartz veins are found quite close to most of the fluorite-bearing pockets. The fluorite of this area is usually pink, but colourless and blue varieties are also present. This colour disappears on heating the mineral. These different varieties of fluorite were tested for fluorescence under ultra-violet light from a mercury vapour lamp. Except one blue variety which showed slight blue fluorescence, the others were non-fluorescent. It was observed, however, that pink fluorite after being decolourized on heating, gives a fairly strong fluorescence when placed in ultra-violet light.

The country close to the lode and the vein materials do not apparently show any sign of shearing in the field but a definite indication of shearing of the minerals has been detected under the microscope. The country rock has been successively replaced by barytes, mica, metalliferous ore-minerals, fluorite and quartz. It is probable that shearing action took place when the ore-minerals were being deposited or before their deposition was complete, that is to say, before the beginning of the fluorite deposition. This is very easily noticed under the microscope, as there is no trace of any shearing phenomena in the fluorite mineral, of the region. The sulphide minerals usually occur as irregular masses scattered at random from the walls to the centre of the pockets. Barytes is a common gangue mineral present in almost all the veins. In some of the fluorite bearing pockets baryte and fluorite form alternating bands and some of the barytes lumps show a coating of fluorite on the surface. Argentiferous galena occurring along the fluorite-bearing pockets is considered as indication of the magmatic origin of the mineralizing materials in this region. Crystallisation of fluorspar is undoubtedly the pneumatolitic phase of the mineralizing magma.

Four prospecting trenches (30' × 12' × 10') have been dug in this area. Out of these four, two are producing galena, and fluorite and one of them contains copper-ore also. The third one produces argentiferous galena and copper ores (melachite and traces of primary sulphide). The fourth one yields melachite incrustations along with the other gangue minerals. In all the trenches the trend of deposits are found to run N.N.W.-S.S.E. In the first trench the galena and fluorite-producing zone is about 3', out of which the western portion produces fluorspar only. Fluorite produced from this pit is generally medium-grained and pink in colour. The yield of fluorite is 20 to 25 per cent. of the rock-body that has been excavated. The second trench produces also fluorite, the pit has been dug about 10' away from the first one along the line of the strike of the lode. The quality produced is good and comparatively bigger crystals are found. The fluorite-producing zone is about 1½' to 2' wide. The percentage of fluorite in the rock-body is about 25 to 30 per cent. of the rock excavated. Hand-picking by breaking the lump rock raised the percentage to nearly 50 per cent. and it is expected that crushing and washing would

increase the concentration of fluorite upto a minimum commercial specification. A more elaborate milling with flgs. and tables followed by a suitable flotation-concentration operation, might further increase the percentage of fluorite to a very high degree. As regards the quantity of material available in this area, it is difficult to say anything definitely at this stage, a further detail prospecting work would prove ore reserve.

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OCCURRENCE OF GARNETIFEROUS LEPTYNITE AT MEENAKSHNIPURAM, COCHIN STATE

LATE Mr. K. K. Sen Gupta, in his 1911 report on the Geology of Cochin State, described two garnet-bearing rocks, one along the tramway line between Mudavarichal and Oorukumbankutty and the other at Pothupara. "The rocks of South Travancore are conspicuous by the abundance of garnets present in them, those of North Travancore and Cochin hardly growing any. Sir Thomas Holland discusses the origin and growth of garnets from pyroxenes and their micropegmatite intergrowths in pyroxenic rocks of South India. The total absence of garnetiferous rocks in the State except two exposures, makes it extremely difficult to verify his conclusion."

We have recently found a big quarry of garnetiferous leptynite on the northern side of the road at the western extremity of Meenakshipuram village in Chittur Taluk. This rock exactly resembles the garnetiferous leptynite of South Travancore. It is leucocratic and consists of quartz, felspar and garnet with biotite and magnetite as accessory minerals. The garnet occurs as reddish-brown grains and patches and belongs to the variety, grossularite.

This discovery proves that this rock is not confined to South Travancore. The relations of this rock with the other rocks of the area are being studied.

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February 7, 1945.

ASSAY OF THE GROWTH-PROMOTING ACTIVITY OF THE "FATS" ASSOCIATED WITH SOME CEREALS

It has been shown^{1,2,3} that the larvæ of the rice moth (*Corcyra cephalonica* Staint) can be employed as a test animal for the biological assay of fat-soluble factors. It was of interest to make a comparative study of the growth-promoting potency of "Fats" from cereals obtained by solvent extraction. Chloroform-extracted jowar constituted the basal diet from which the "whole" diets were reconstituted by enriching the flour with the fat from each of the cereals to the extent of 4.28 per cent.—this being the percentage of "fat" in jowar.

A further comparison of the fats of the cereals was made with a sample of shark liver oil.

Results are tabulated below:—