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SUMMARY OF THE RESEARCH PROGRESS MEETING OF JANUARY 18, 1951

Margaret Foss Folden

June 26, 1951

Berkeley, California

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Physics at Duke University - H. W. Newson.

Studies at Duke University on level separations in compound nuclei after the absorption of a neutron were described. The rising levels of excitation measured by time of flight studies were described. Bethe's results and those at Duke were compared. Their results indicate with a surprising constancy that the spacing from neutron 10 to neutron 50 is about 5×10^5 volts. Studies are being made in the region of N = 28 to 45 with Sc^{81}, Cu^{65} and As^{75} have been investigated.

Measurement of Liver Circulation - Ernest L. Dobson.

The circulatory system was first described in general.

In these experiments the quartz rod transillumination technique was used to obtain information on liver circulation, and injections of india ink made observations more certain. The phagocytes interlaced among the sinusoids take up certain colloidal material; this fact was used to study the liver circulation. P^{32}, labeled chromic phosphage colloid, was injected into the blood. A short mixing time of about two minutes for large animals is required. The logarithm disappearance equation abtained from this treatment is given by:

$$\text{concentration} = ce^{-(K)t}.$$

The disappearance rate is measured to determine K. Assume that all the blood going to the liver is cleared of the colloid, then a measure of the rate of blood flow through the liver is obtained. The spleen takes out from 1 to 20 percent of the colloid, but since these two organs are in series it does not matter,

The lymph nodes do not take out the colloid. Bone marrow takes up a small amount of the chromic phosphate, so the equation must be written

$$C = ce^{-(m_{\ell}\ k_{\ell} + n_{bm}\ k_{bm})t}$$

where ℓ = liver and bm = bone marrow. The actual disappearance curve is shown in Fig. 1. The three components shown can not be explained on the basis of liver efficiency, taking out the large particles and letting the small ones go through. In the samples of blood early in the curve centrifugation has removed the colloidal material; however, late in the curve material was not removed. The colloidal particles varied from .01 to 5 microns.

The blood tissue perfusion factor is the factor most constant from one animal to another. It has been found that in man the factor is 1.2 volume blood per volume liver per unit of time. In chickens the factor is 5.0; in dogs 1.2; in the anesthetized mouse 1.7; in the normal mouse 1.4; in the normal rabbit 0.74; and in the anesthetized rabbit 1.12.

Photographic Fourier Summations - David H. Templeton.

Studies have been made on the desnity of electrons using the equation:

$$\rho(xy) = \sum\sum_{hko} F_{hk} \cos\,(hx + ky)\ 2\pi$$

where $\rho(xy)$ = projection on the xy plane

F = structure factor

$|F|^2$ kI = intensity of Laue spots.

This method is a photographic way of representing the theory and makes use of photographic masks. The light transmitted is proportional to

$$1 + \cos\,(hx + ky)\ 2\pi.$$

The masks are exposed for a length of time proportional to F. When the film is developed the dark spots give the location of the atoms; that is, the method

determines h and k by the process of approximating the Laue pattern by a succession of superposed patterns with known h and k. Figure 1 gives examples of the patterns used corresponding to typical terms in the Fourier series. Thorium boride, yttrium fluoride and rhenium bromide are among the compounds investigated.

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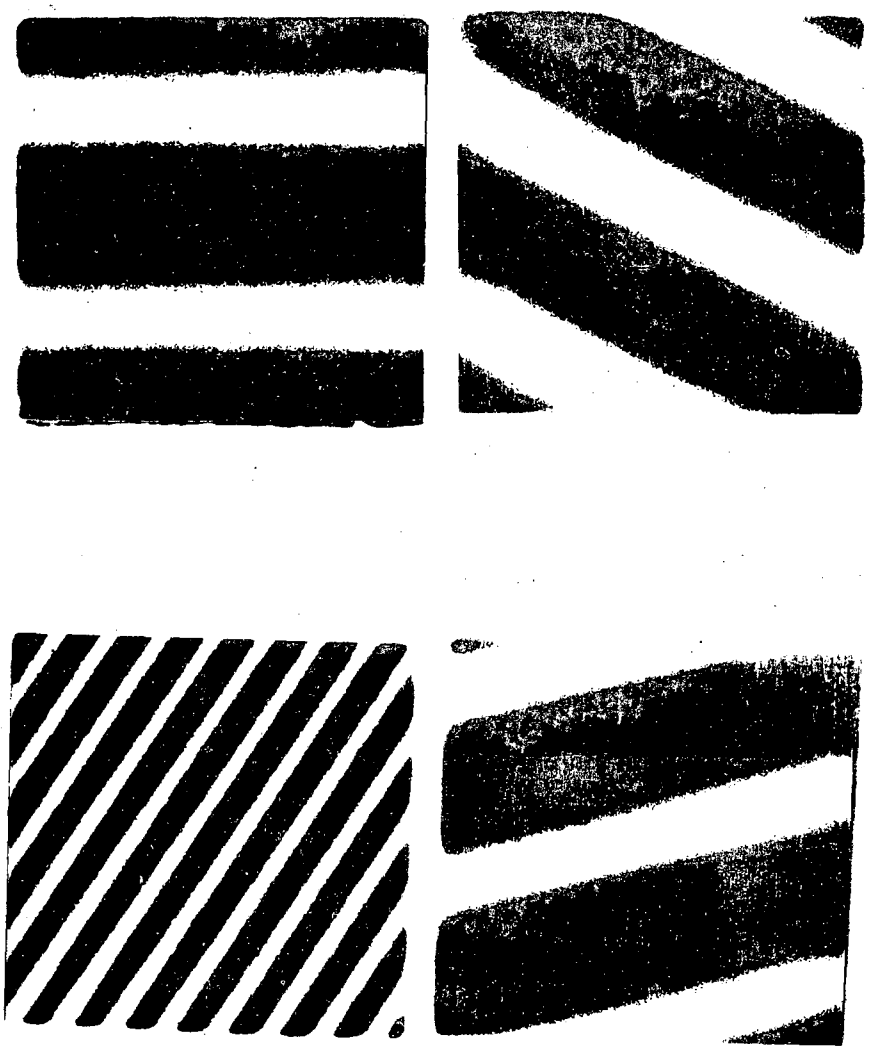

Fig. 1