± 0.0014, $Pt^{196} = 196.02744 \pm 0.00060$, and $Pb^{208} = 208.0422 \pm 0.0015$. These masses plus some previously reported ones may be combined with appropriate disintegration data to obtain mass values for 70 of the heavier nuclides. A packing fraction curve drawn from these data shows the unequivocal mass effect associated with the 50-neutron configuration,[1] and some mass evidence in support of the magic numbers 14, 16, 28, 32, and 40. Doubly-magic nuclides are suggested as marking major transition points in the packing fraction curve.

* Based on work done at Wesleyan University under contract with the AEC.
† Now at Yale University, New Haven, Conn.
[1] Duckworth, Woodcock, and Preston, Phys. Rev. **79**, 198 (1950).

11. Masses of Mo^{94}, Ba^{138}, Pr^{141}, Nd^{144}, and Hf^{180}. G. S. STANFORD, J. M. OLSON, AND H. E. DUCKWORTH, *Wesleyan University.**—The following packing fraction differences have been measured: $Hf^{180} - Ni^{60}$, $\partial f = 8.56 \pm 0.03$; $Hf^{180} - Zr^{90}$, $\partial f = 7.70 \pm 0.03$; $Pr^{141} - Ti^{47}$, $\partial f = 3.67 \pm 0.03$; $Ba^{138} - Zr^{92}$, $\partial f = 3.63 \pm 0.04$; $Pr^{141} - Mo^{94}$, $\partial f = 3.54 \pm 0.05$; $Nd^{144} - Mo^{96}$, $\partial f = 3.66 \pm 0.04$. These measurements when combined with previous results lead to the mass values $Mo^{94} = 93.9350 + 0.0011$, $Ba^{138} = 137.9491 \pm 0.0011$, $Pr^{141} = 140.9525 \pm 0.0016$, $Nd^{144} = 143.95666 \pm 0.00087$, and $Hf^{180} = 180.0004 \pm 0.0014$. Typical mass spectra will be shown.

* Based on work done at Wesleyan University under contract with the AEC.

MINUTES OF THE OHIO SECTION MEETING AT THE OHIO STATE UNIVERSITY, COLUMBUS, OHIO, FEBRUARY 24, 1951

THE regular mid-winter meeting of The Ohio Section of The American Physical Society was held in the newly built Physics Building of The Ohio State University, Columbus, Ohio, on Saturday, February 24, 1951. Fifty members were present. The Committee studying extension of area reported that the members were not interested in assuming the initiative for an expansion at this time. Abstracts of four papers follow; a fifth, by Professor Phillips of Marietta, was called by him "Rotary" Physics. Then followed the invited paper by Dr. Edward S. Foster, Jr., of University of Toledo, entitled "Physics of Weather."

LEON E. SMITH, Secretary,
Ohio Section,
Denison University,
Granville, Ohio.

Generation of Functions by Windup Mechanisms. R. A. HARRINGTON, *B. F. Goodrich Research Center.*—A cam driving a pen by means of a tape or string wound on it can be conveniently represented and machined as the envelope of its tangents. If the pen travel is a function F of the angle θ through which the cam shaft turns, the distance ρ between the extended tape center line and the shaft axis is given by $\rho = dF/d\theta$. The angle Φ between the tangent normal and a line fixed with respect to the cam is useful in machining the cam. If the tape after leaving the cam passes over a pulley of effective radius r, whose axis is parallel to the cam shaft axis and distant D from it, $\Phi = \theta - \text{arc cos}[(\rho - r)/D]$. (Here r is taken as positive or negative according to whether the cam and pulley turn in the same or in opposite directions.) The correction for finite thickness of the tape or string is simple: ρ and r are altered by adding or subtracting half this thickness. In order that a function $F(\theta)$ may be generated in this way, it must be continuous and have a continuous derivative, and the sign of the quantity $\rho + d^2\rho/d\Phi^2$ must not change. This quantity is approximated by $dF/d\theta + d^3F/d\theta^3$. Sometimes a function which does not satisfy this condition can be generated by a cam turning through a multiple or submultiple of θ.

The tangent envelope representation should also be useful in designing windup mechanisms in which the tape drives a second cam instead of a pen.

An Approximation to the Normal Modes and Frequencies of Extended Chain Molecules. W. EDWARD DEEDS, *The Ohio State University.*—By neglecting only the Coriolis interaction energy, it is possible to obtain a good approximation to the kinetic energy of large molecules in which characteristic groups of atoms occur by considering each characteristic group as a rigid rotator, in so far as the framework vibrations are concerned. This method has been applied to the case of an infinite, extended, zig-zag chain, such as the long chain paraffins. Rotations and out-of-plane vibrations of characteristic groups have been included, and boundary conditions have been applied to solve the problem for chains of finite length. Also, a condition on the force constants of any molecule can be obtained from the physical requirement that all of the roots of the secular equation must be real. This condition is distinct from the one that the potential function must be positive definite and can sometimes be used to put an upper limit on unknown force constants or to decide between various possible sets of force constants.

Microwave Absorption Spectrum of Hydrogen Azide.* JOHN D. ROGERS AND DUDLEY WILLIAMS, *The Ohio State University.*—Several closely spaced absorption lines in the vicinity of 23,815 mc/sec have been observed in the absorption spectrum of hydrogen azide N_3H. These lines are associated with the rotational transition $J_\tau = 0_0 \rightarrow 1_{-1}$, and the observed hyperfine structure can be explained qualitatively in terms of quadrupole interactions between the nitrogen nuclei and the molecular field. From the observed spectrum the sum of the rotational constants $B + C$ is found to be 23,813 mc/sec. The observed Stark effect is quadratic; i.e., $\Delta\nu = \beta E^2$. The Stark coefficient β was found to be 2.00 ± 0.02 mc cm^2/sec volt^2. The results obtained in the present study will be compared with those of Dailey, who has studied several isotopic species of hydrogen azide.

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Nuclear Magnetic Moment of Boron^{10}. YU TING AND DUDLEY WILLIAMS, *The Ohio State University.*—A nuclear magnetic resonance absorption peak due to B^{10} has been observed by means of super-regenerative techniques. The sample used was an aqueous solution of $Na_2B_2O_4$ containing the naturally occurring mixture of boron isotopes, in which B^{10} has an abundance of approximately 18.4 percent. The value 1.8006 nuclear magnetons obtained for the B^{10} magnetic moment will be compared with the value obtained by other methods.