an invention a year old or several years old. Second, the issue of patents drops greatly during and following an economic depression, such as that following the year 1929. Third, changing policies in the Patent Office produce unmeasurable changes in the number of patents allowed to issue.

In a normal year about one patent issues for every two patent applications filed, but in the year 1935, about one patent issued for every one and one-third patent application filed, most patents being based on patent applications two, three or more years old.

On the other hand, the number of patents issued varied little during the ten years from 1870 to 1880, although those years saw the invention of the electric motor, the telephone, the incandescent electric lamp and other important inventions shown in the Centennial Exhibition of 1876.

The number of patents issued each year by some other nations varies much more widely and more rapidly than in the United States. England, for example, issued about 12,000 patents in 1931, about 24,000 in 1930 and about 35,000 in 1933. It is obvious that the number of patents issued is an unsafe guide by which to measure progress.

The proportion of chemical patents issued each week in the United States has, in contrast, remained singularly constant for thirty years at about one in every fourteen of all patents issued. In other words, the curve of progress in mechanics must be nearly identical with the progress in chemistry if statistics of issued patents mean anything.

One further observation must be made pointing to the years 1914 to 1918, and that is to point the lesson of the cost of war. The asserted stimulus to chemistry due to war does not appear either in those years or in any showing of heaped-up and buried progress released to show itself at the end of the war. On the contrary, each year of war apparently set back progress more than the progress gained in a year of peace, and each year of war apparently added its set-back to the set-back of the previous year of war. It is evident that the much-boasted chemical progress whipped-up to meet war needs is trivial compared to the work-a-day progress in times of peace.

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POLYGONBODEN ON MT. DESERT ISLAND, MAINE

Antevs[1] has described both fossil and modern stone nets and stone stripes from the Presidential Range, New Hampshire, and from Mt. Katahdin, Maine, at elevations of 4,000 feet and higher. The authors have found modern stone nets and stone stripes on Cadillac Mountain and on Jordan Mountain, and Professor Edward H. Perkins, of Colby College, has found them on Sargent Mountain, Mount Desert Island, Maine. On Cadillac Mountain they were observed as low as 1,300 feet and on Jordan Mountain as low as 1,100 feet, which makes these the lowest described Polygonboden in the United States. The nets and stripes on Jordan Mountain are embryonic and vague but rather numerous. Those on Cadillac Mountain are in many cases well formed, as well formed as any the authors have seen on Mount Washington, besides being much more numerous. These structures are found in the small barren patches of more or less modified glacial till, sometimes admixed with disintegrated granite, which is still preserved in places. The average diameter of the nets is one to two feet and the stripes are from four to five feet long. These are undoubtedly being formed at the present time and are similar to the modern stone nets and stone stripes which Antevs has described. These structures are undoubtedly present on other peaks of Mt. Desert Island, and it is the intention of the authors to return and go over the ground more thoroughly with the hope of finding these features at lower levels, perhaps even at sea-level.

It is generally agreed that the conditions necessary for the formation of these structures are: (1) freezing temperatures; (2) correct soil conditions; (3) flat areas with slight slope and (4) barren areas. It may well be that the first three of these conditions obtain at sea-level in the Mount Desert area. However, barren areas are not common unless made by man. An examination of old sand and gravel pits might furnish some interesting data, and along this line it would be interesting to prepare some earth at sea-level to see if the Polygonboden would form. The authors spaded up one area which contained especially well-developed structures with the idea of returning to collect data on their rate of formation. The material in which the Polygonboden are formed often rests in rock basins, which condition makes for a high water table. This condition, together with the high precipitation on the Mount Desert mountains and the great number of barren areas, is probably responsible for the low elevation of the Mount Desert Polygonboden.

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[1] Ernst Antevs, "Alpine Zone of Mt. Washington Range," Merrill and Webber Company, Auburn, Me., 1932.

"PETRIFIED WALNUTS" VS. CONCRETIONS

Several years ago Mrs. George W. Rust, who was then Miss Alce Ann Clark, student of the University of Chicago, was shown some "petrified walnuts" by a resident in the vicinity of Dayton, Wyoming. Mrs. Rust brought some of them back to Chicago with her and gave them to Professor F. J. Pettijohn, who examined them and commented on their unusual characteristics.

Quite ignorant of the fact that such concretions had been previously seen by Professor Pettijohn, the writer described[1] some concretions (apparently of the same sort) which were given to him by Mrs. F. C. Sayles, Jr., Ishawooa, Wyoming. Their external surface and size is remarkably similar to that of a black walnut. When broken open, they show an irregular chamber containing dark-colored oxides (the nutmeat?), which is encased in a plumose structure made up of radiating crystals of dahllite. This mineral is comparatively little known, although it is not rare in phosphorites.

Concretions of similar structure and mineralogical composition occur in Podolia, U. S. S. R., and these are described by O. Stutzer[2] as being as large as a "Kegelkugel" (bowling ball).

DUNCAN McCONNELL

FLUCTUATIONS IN NUMBERS OF VARYING HARES

SINCE the autumn of 1931 an investigation of the recurrent rise and fall in numbers of snowshoe rabbits or varying hares (*Lepus americanus*) in Ontario particularly has been in progress under the joint auspices of the department of biology of the University of Toronto and the Royal Ontario Museum of Zoology.

No hares sick with tularemia have been found, but of twenty-four samples of blood serum tested previous to 1935 three gave a positive agglutination reaction, indicating that these animals had recovered from the disease.

A chronic infection with *Staphylococcus aureus* is common and correlated with the fact that snowshoe rabbits have practically no Staphylococcus antitoxin in their blood. One fatal case of empyemia with pus all through the lungs and heart has turned up. The pus masses of the more common cases, on the head, legs or chest, certainly reduce the beasts' margin of safety under adverse conditions. Several other diseases are being studied.

That part chiefly of the normal intestinal flora of varying hares which is composed of bacteria of the family *Bacteriaceae* Cohn has been surveyed.

The most serious helminth parasite has been a strongylid stomach worm, probably Obeliscoides. A moderate number of these blood-sucking worms have been found in the stomachs of nearly all the hares autopsied from all parts of the province and may be considered "normal." However, it does appear to have caused the deaths of six out of seven recently captured and well-cared-for hares that died "natural deaths" at Smoky Falls on the Mattagami River in northern Ontario in the summer of 1935.

In general, the last winters of great abundance of hares in various sections of the province were as follows: northern part of Frontenac County, 1931–32; southern Ontario, 1932–33; central Ontario north to about the height of land, 1933–34; northern Ontario, 1934–35 (questionnaires this coming winter will corroborate or modify this last statement); and the region west of Lake Nipigon averages intermediate between northern and central Ontario. This is in accordance with the northward trend of isotherms and life zones to the west.

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MILK AS A SOURCE OF VITAMIN C[1]

ESTIMATES of the amount of vitamin C in milk have varied widely. More recent studies have placed the amount of fresh raw milk needed to protect a guinea pig from scurvy at approximately 40 cc per day. The amount of purified vitamin C needed for protection of this species has ranged from 0.7 to 1.3 mg daily. If the average of 1.0 mg per day is accepted, milk should contain about 25 mg of vitamin C per liter on a comparable basis.

The authors have had an opportunity to make chemical tests of the vitamin C content of milk on an extensive scale. A total of 502 determinations have been made to date on the milk of 55 cows representing the four major dairy breeds—Holstein, Jersey, Guernsey and Ayrshire. An average value of 25.9 ± 4.3 milligrams per liter was secured.

While no conclusive data pertaining to the human requirement for vitamin C are available, a range of 19 to 27 mg daily has been suggested as the minimum protective requirement.[2] Fresh milk, therefore, may be an important source of vitamin C. It has been found recently at this station that much of this vitamin C content can, with proper precautions, be conserved satisfactorily either in raw milk or in milk that has been pasteurized by the flash method.

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[1] *Amer. Mineral.*, 20: 693–698, 1935.
[2] Die Wichtigsten Lagerstätten der Nicht-Erze, Vol. I, p. 341, 1911.

[1] Contribution No. 200, Department of Chemistry and No. 105, Department of Dairy Husbandry.
[2] G. F. Gothlin, *Nature*, 134: 569, 1934.