for a period exceeding two months and had accumulated records of tests on over 200 human patients. Since Eli Lilly and Company was actually preparing pure ergotocin it might justifiably have continued to apply that name to its commercial product. Actually, however, the latter has been given the trade name, "Ergotrate."

The question as to whether or not ergotocin is an "alkaloid" seems to us to be essentially meaningless, since there are no definite chemical criteria by which a substance may be characterized as alkaloidal or non-alkaloidal. In the earlier paper already cited we called attention to the loose usage of the term "alkaloid," and made it clear that our own use of the term "non-alkaloidal" was intended merely as exclusive of the previously known ergot "alkaloids" rather than as chemically descriptive.

It is possible, though not altogether obvious, that the principle responsible for the physiological activity of ergometrine is identical with ergotocin. It is, however, obvious that ergometrine, as described by Dudley and Moir, is not identical with ergotocin. Our own analyses of pure ergotocin and several of its salts indicate the empirical formula $C_{21}H_{27}N_3O_3$ (C, 68.41 per cent.). (For details, as well as for a discussion of the cleavage products of ergotocin, see the June number of the *Journal* of the American Chemical Society.) Dudley and Moir have announced that ergometrine has a carbon content of 71.46 per cent. The discrepancy would seem great enough to survive any "slight modifications" necessitated by "more drastic purification" of an essentially pure substance. The physiological properties attributed to ergotocin and to ergometrine are similar but evidently differ in degree. The oral dose of ergometrine recommended by Dudley and Moir for human patients is 0.5–1.0 mg; ergotocin is uniformly effective in oral doses of 0.25–0.30 mg. On the whole, the assumption of identity of the active principles appears premature; moreover, that assumption would seem to lead inevitably to the conclusion that ergometrine is impure or partially inactivated ergotocin.

The implication that the chemical investigation of ergot by the present authors was suggested or inspired by Dr. Moir's American addresses seems to us irrelevant to the issue raised. As a matter of strict historical fact, however, our interest in ergot had quite another origin. Neither of us had the pleasure of hearing Dr. Moir during his American visit, nor did we, indeed, hear of him until after we had succeeded in separating ergotocin from the "known ergot alkaloids" late in 1923.

M. S. KHARASCH
R. R. LEGAULT

THE UNIVERSITY OF CHICAGO

THIOBARBITURATES

THE report of the hypnotic action of a series of barbituric acid derivatives by Fischer and von Mering[1] in 1903 led to the introduction of barbituric acid compounds into medical practice. Hundreds of substituted barbituric acids and their soluble salts, alone and in various combinations, have been prepared since then in the unceasing search for better products. Some of these compounds have been found to possess valuable therapeutic properties, and their use is rapidly increasing.

Barbiturates may be prepared by condensing urea (or a substituted urea) with derivatives of malonic ester. In a similar way we have prepared a series of thiobarbiturates, using thiourea (or a substituted thiourea), instead of urea. Only a few thiobarbiturates have been previously reported and these have been used merely as intermediates in the preparation of barbituric acid compounds.

There is almost complete lack of pharmacological, clinical and toxicological information in the literature on thiobarbiturates. This may be due to the findings of Fischer and von Mering that the administration of 120 mg per kilo of the sulfur analogue of barbital to a dog produced deep sleep, followed by death. This finding was broadcast by Fraenkel,[2] who deduced therefrom that the presence of sulfur imparts to diethylthiobarbituric acid a pronounced toxic character.

The authors have made and studied a number of thiobarbiturates, finding that they show promise as sedatives. They produce quiet, natural sleep and are free from side actions and from the after-effects observed following the use of their oxygen analogues. This work is being continued and will be reported in detail elsewhere.

ELLIS MILLER
JAMES C. MUNCH
FRANK S. CROSSLEY

SHARP AND DOHME
PHILADELPHIA, PA.

THE USE OF THE TERM POCONO

IN a recent article George H. Chadwick asks "What is Pocono?",[1] a question which has of late been troubling some stratigraphers in Pennsylvania. From Mr. Chadwick's article it appears that the original definition meant to include certain beds found under-

[1] E. Fischer and J. von Mering, Therap. d. Gegenw., 101: 97, 1903.

[2] S. Fraenkel, "Die Arzneimittel-synthese," 6th ed., 1927, p. 510.

[1] G. H. Chadwick, *Am. Jour. Sci.*, 5th ser., 29: 133–143, 1935.

lying the Pocono Plateau of eastern Pennsylvania. These beds, Mr. Chadwick has clearly demonstrated by both text and figure, may be of late Devonian rather than early Mississippian age, a perfectly reasonable belief in the light of recent changes in the interpretation of the Devonian of eastern New York and Pennsylvania. Therefore, the use of the term Pocono formation for these beds is inapplicable if it is also to include early Mississippian strata in other parts of Pennsylvania. But, paradoxically, the first published use of the term Pocono did not include the so-called Pocono of the Pocono Plateau. The first clear recognition of the formation, though under a different name, was that of Rogers[2] in his Vespertine or No. X formation:

> The Vespertine group of strata, the first of the carboniferons formations of the Appalachians, has a very wide distribution in Pennsylvania, encircling with a sort of outer girdle all the coal-fields, both the anthracite and the bituminous ones, of the State. It undergoes gradual but important changes of type, growing thinner and assuming a finer and finer texture in its materials as it spreads westward. Its orographic position is in the mountain-ridges and external escarpments of the table-lands which enclose or support the coal-fields; but, except in the northwestern district of the State, it does not immediately adjoin the conglomerates and sandstones of the coal-measures, but is separated from them by a greater or less thickness of the soft, umbral rocks, which fill either an intervening valley or an intermediate space on the coal-bearing table-lands.

From Pennsylvania southward this is essentially the definition of the Pocono as now in use,[3] and is equivalent to that officially recognized by the present Survey.[4] The first published use of the term Pocono as a stratigraphic term, in so far as the writers can ascertain,[5] is on the geologic maps of Bradford and Tioga counties, Pennsylvania, published in 1876. These were prepared by Andrew Sherwood under the direction of J. P. Lesley and accompany Volume G of the Pennsylvania Second Geological Survey. The text did not appear until 1878, and, curiously, does not use the term Pocono at all. On the map the formation is indicated as "X Pocono Sandstone" lying between "IX Catskill" and "XI Red Shale," but in the text is referred to as "White Catskill." This use accords with the Vespertine of Rogers. Not until 1877 did a fuller definition appear. In that year both Ashburner[6] and Franklin Platt[7] published definitions. They state that the term was proposed by Lesley to supplant Vespertine No. X of Rogers. As defined by both it is confined to beds between the "Catskill" and Mauch Chunk. But, Platt wrote:

> If No. IX be properly called the Catskill Formation because it forms the mass of mountains between the Hudson River and the Delaware, it is perfectly proper that the Gray Sandstone formation, No. X, next above it, should be called the Pocono formation, for it forms the mass of the great mountain plateau between the Delaware and Lehigh rivers.

Clearly, if Mr. Chadwick be correct, this definition is in error; and it is this to which he rightly objects, but the interesting fact remains that this is not the first use of the term. From these data it appears that Lesley, perhaps at a staff conference, certainly not later than 1876, proposed the term Pocono to replace Vespertine and intended it to be applied throughout the state wherever Vespertine had been used, whatever his type locality may have been. Such was the intent in the first use by Sherwood on two published maps of a region remote from the Pocono Plateau. His use is that which many subsequent writers adopted in applying the name Pocono in many parts of Pennsylvania, and it is in this very sense that the term Pocono is now accepted and used stratigraphically in the state and to the south. Its application to the plateau between the Delaware and Lehigh rivers, whatever Lesley's original intent, may be wrong and, if so, has been wrongly followed. But it seems reasonable that Lesley's original thought, even though he incorrectly dated the beds of the plateau, was to apply the name to the sandstone between the "Catskill" and Mauch Chunk, else the 1876 maps could not have appeared with his approval.

There seems no necessity for discontinuing the use of the name Pocono formation for the gray sandstones and conglomerates probably of early Mississippian age which overlie the highest recognized Devonian beds and help support the Allegheny Front, border much of the anthracite fields, produce prominent ridges in central Pennsylvania and appear as more or less flat-lying beds in the western parts of the state. But, in so doing, we must bear in mind the anomalous situation that the first published application of the term was not to a type locality of that name. Here we have a term derived from a type locality which turns out to be probably inappropriate, yet it was originally applied in print, not to that type locality, but to a different place but in the correct, original sense and intent. Subsequent stratigraphic studies may even

[2] Henry D. Rogers, "The Geology of Pennsylvania," Vol. I, 142–143, 1858.

[3] D. White, *Am. Jour. Sci.*, 5th ser., 27: 265–272, 1934.

[4] George H. Ashley, Penna. Topog. and Geol. Surv., Bull. G–1, 1931.

[5] The writers are indebted to Miss M. Grace Wilmarth, who has kindly checked the data on the early use of the term; letter of February 15, 1935.

[6] C. A. Ashburner, *Proc. Am. Phil. Soc.*, 16: 519–560, 1877.

[7] F. Platt and G. W. Platt, Penna. Second Geol. Surv., Vol. H2, 1877.

change our ideas about that locality. Evidently, in the case of Pocono, we are forced either to propose an entirely new term, or, and this is by far the more reasonable and least confusing course, accept a name, which, however dubious its origin, is made acceptable by long usage.

GEORGE H. ASHLEY
BRADFORD WILLARD

PENNSYLVANIA TOPOGRAPHIC AND GEOLOGIC SURVEY

DELAYED ACTION OF SELENIUM POISONING OF LIVE STOCK

THE various manifestations of selenium poisoning of live stock by ingesting grains, forages and native range plants carrying toxic and lethal quantities of selenium has received considerable attention during the past few years from chemists and physiologists in the U. S. Department of Agriculture and in a few state experiment stations. Through accumulative data covering many field and experimental cases, it appears that under certain conditions not understood at present an animal may not show any outward sign of poisoning perhaps for several months after grazing upon range plants carrying selenium. When the "break down" occurs, death usually follows in from one to six days. Those that survive seldom regain normalcy. Severe cases show much characteristic pathology.

It is indeed surprising to observe cattle and sheep in an apparently sound and healthy condition suddenly go "off feed," pass bloody urine and rapidly lose weight. To one not familiar with this type of poisoning, it is generally interpreted as due to some immediate physiological disturbance. As a matter of fact, it is now known that such cases may have grazed the causal toxicant months previous to the occurrence of the final acute stage.

O. A. BEATH

UNIVERSITY OF WYOMING

AQUATIC ANIMALS AS COLLECTORS

RECENTLY, when examining some young specimens of the Ocean Sunfish (*Orthagoriscus mola* and *Masturus lanceolatus*), these giants of the ocean, weighing from 400 to 2,000 pounds, I discovered certain young individuals, measuring 2½ inches, among the collections of fishes of the Museum of Comparative Zoology, Cambridge, Mass. They have been found in the stomach of a dolphin.

Another giant fresh-water fish is the Great Caspian Sturgeon (*Huso huso*), which also attains the weight of 2,000 pounds. The young of this species were unknown for a long time until I happened to discover them, as well as those of other sturgeons, in the stomachs of cat-fishes (*Silurus glanis*).

Thus, naturalists are indebted to the voracious dolphin in the ocean and to the voracious cat-fish in fresh waters for collecting the rarest specimens of the young of two giant fishes.

By publishing this short notice I would like to call the attention of my ichthyological colleagues to those facts and urge to lose no opportunity of dissecting the stomachs of voracious aquatic animals with a view to finding other fish which they have swallowed. Those creatures may prove of great assistance to us in collecting very rare specimens.

N. A. BORODIN

MUSEUM OF COMPARATIVE ZOOLOGY
CAMBRIDGE, MASS.

EXTENDED HIBERNATION IN THE TOAD

THE writer believes he has an example of extended hibernation in the common toad, *Bufo americanus*.[1] In 1908, the W. E. Caldwell Company, Louisville, Kentucky, constructed a structural steel plant over some filled swampy land. On November 1, 1934, twenty-six years later, while digging in one of the buildings for the placing of a new furnace, two toads were exhumed. The first was about four and one-half feet and the second nearly eight feet below the clay floor of the building. An examination of the walls of the pit showed the fill to be of yellow clay with an occasional small air space, none over one-half inch in diameter. There was no indication of any type of passage-way by which the toads may have entered. The closest distance from the pit to the wall of the building was twenty-five feet. The foundation of the building is fourteen inches thick and extends four and one-half feet below the clay floor of the building.

The workmen placed the first toad on the edge of the pit, believing it to be dead, but in a short time it hopped away. The second toad was saved. It was so thin that little remained but skin and bones. It revived to such an extent that it was able to hop and to turn over when placed on its back. When it was brought into the warm laboratory, it died within two hours.

P. A. DAVIES

UNIVERSITY OF LOUISVILLE

ECOLOGICAL NOTE

OUR *Felis domestica* recently committed a nuisance on a small rug. He then removed from the bookcase a Guidebook to Boston and a Guide to the Wild Flowers of Pennsylvania, with which he carefully covered his misdeed.

E. A. VUILLEUMIER

DICKINSON COLLEGE

[1] The writer is indebted to Mr. Walter E. Caldwell for calling his attention to the hibernation and for permission to examine the pit and to take the necessary measurements.