CLAREMONT COLLEGES, Calif., announces an essay contest under the auspices of the John Muir Enterprise. Manuscripts should be of suitable length for magazine publication but should not exceed 3,000 words, and must reach the judges before February 1. This contest is part of a project to encourage "interest in the study of nature and an appreciation of beauty and other values in nature as a force in noble living." Three prizes are offered of $100, $75 and $50. Each essay should consist of "an original study of some subject in nature or about nature and should embody the appreciation of such factors as beauty, strength, form, variation and other values." Complete information may be obtained by writing to the John Muir Enterprise, Claremont, Calif.

THE *Journal* of the American Medical Association reports that the Kitasato Institute for Infectious Diseases, Tokyo, celebrated its twenty-fifth anniversary on November 5. The institute was founded by Baron Kitasato, the Japanese bacteriologist who discovered the bubonic plague bacillus, after he had served many years as director of the Imperial Japanese Institute for the Study of Infectious Diseases. Baron Kitasato was born in 1856 and died in 1931.

DISCUSSION

STAGNATION OF ICE IN CONNECTICUT

IN a recent review[1] of my report on the physiography of the Quinnipiac-Farmington Lowland in Connecticut,[2] Richard Goldthwait has presented an impartial and highly complimentary summary of my views. However, as a stanch believer in stagnation of ice in New England he has raised a few questions which I take this opportunity to answer. Because stagnant ice is far easier to visualize than to disprove, my report did not attempt to answer all the countless claims for it, but rather to demonstrate by good scientific logic of a normal retreat explanation, as well as by positive disproof of stagnation claims in vital localities, that stagnation in Connecticut is highly improbable.

Thus, although my reviewer made only passing mention of the map of a proglacial delta which I presented in my report to show that a late-Glacial water body existed at Southington, Conn., he was not aware that this map had to be made expressly in order to convince some who had seen the feature in question with me in field conferences that it was indeed a delta, and others who steadfastly believed that the delta lobes were ice contacts formed against ice on the south. In this case it took six weeks of mapping to disprove stagnant ice in one small locality where it had been claimed, but left little doubt that the upper Quinnipiac Valley was uncovered by normal retreat.

With similar purpose Dana's well-known old map of New Haven,[3] sprinkled with elevations, had to be reprinted to make clear that the New Haven Plain is not a horizontal terrace—as all Connecticut terraces have at times been described in stagnation literature. The review mentioned that I detected post-Glacial regional deformation, but did not state that the measurement is 5½ to 6 feet per mile, established by levels that I ran ten years ago, whereas in an equally long period of stagnation studies no measurable deformation had been recognized in Connecticut.

Referring to specific points Goldthwait states that "a few ideas, which supporters of down-wastage may well challenge, are, first, that ice-contact deposits like the Mill River red 'valley train' will show good preservation and down-valley alignment if deposited more or less simultaneously in pools along quasi-stagnant ice masses, but not when deposited one by one around a retreating stubby tongue of active ice." This question concerns the morphology of valley trains. There are numerous text-book illustrations of valley trains formed by streams flowing from retreating stubby tongues of active ice, but I have never seen a case demonstrated in the plentiful pictorial literature on living glaciers where valley trains have been formed in pools along quasi-stagnant ice masses.

"Secondly," it is stated, "the absence of significant early drift in the lower Quinnipiac Valley implies presence of ice there which barred deposition, while the high Mill River and upper Quinnipiac valley received gravels." This statement is misleading because it presents an inference and not a fact. The inference is based on Flint's[4] and not on my field work. I found no lack of "significant early drift" in the lower Quinnipiac Valley in the form of varved clay and deltas which Ward[5] and I both interpret to indicate open water. The submerged condition of the lower Quinnipiac Valley, which made it an effective barrier to the advance of coarse sediment, explains the difference in character and extent of filling by solid matter as compared with the higher, steeper and narrower Mill River Valley, which offered free drainage for a powerful river carrying coarse sand and gravel. The contrast in the two valleys is completely

[1] R. P. Goldthwait, *Jour. Geomorphology*, 2: 166–169, 1939.

[2] R. J. Lougee, Colby Monographs, No. 7, 64 pp., 15 plates: Colby College, Waterville, Maine, 1938.

[3] J. D. Dana, *Am. Jour. Sci.*, 3rd ser., 26: 341–361, 1883; 27: 113–130, 1884, p. 113.

[4] R. F. Flint, *Am. Jour. Sci.*, 5th ser., 27: 81–91, 1934, p. 88.

[5] Freeman Ward, Conn. State Geol. and Nat. Hist. Survey, *Bull.* 29, 78 pp., plates and maps, 1920, p. 55.

accountable without lingering ice, and, indeed, there is no direct evidence of the latter.

"Finally," Goldthwait says, "it must be admitted that undulating pitted outwash, even with local foreset structure, as along the western edge of the Farmington Lowland, is a poor record of an extensive water level, whereas it fits well the picture of long marginal streams and pools." The writer believes this viewpoint arises from a consideration of the seventeen-mile zone of outwash along the western side of the Farmington Lowland as a single deposit rather than from the point of view of the units that compose it. The only general direction of slope and structure is eastward at right angles to the trend of the valley and any hypothetical long marginal streams. This deposit appears to be a connected series of parallel fans spread on land and terminating locally in deltas where they reached standing water. The profile from south to north is highly irregular, and local delta structure is interpretable as marking fluctuating water levels. At one point, nearly opposite the Tariffville Gap, the profile declines abruptly to be resumed at a lower level northward. The only explanation that easily covers all these varied facts is that of a northward retreating ice tongue terminating in a general valley lake that created a high but fluctuating base level for the outwash surfaces until the end of the tongue retreated north of the Gap with consequent draining of the lake and abrupt lowering of base level for all later outwash. The concept of a stagnant ice block and pools[6] was thoroughly considered and found to explain some details but not the complex combination of interrelated features of the Farmington Lowland.

Referring to the color distinction between old red and younger yellow or buff sediments in the Lowland, Goldthwait says, "Lougee does not mention the excellent work by Krynine[7] on these sediments." With this statement the writer can not agree. It is true that this particular paper written by Krynine with suggestions and criticisms by Flint was not quoted in my report, but this was because its conclusions, based on petrographic analysis, were of doubtful correlative value in my physiographic study. An example will make my meaning clear:

I have described and pictured[8] a massive deposit of fine light tan- or buff-colored dune sand that the prevailing westerly winds have drifted against the eastern margin of the Quinnipiac Lowland, three quarters of a mile northeast of Fair Haven. It is traceable high up the slopes, at least to 70 feet elevation, and is still actively blowing into drifts where stripped of vegetation. The composition shows that the dune was probably blown up from the adjacent river flood plain a few hundred feet away, where, after the valley had been drained of static water, a train of yellow or buff sand was spread somewhat below the present salt-marsh level by a glacial river from the Farmington Lowland. Buff sand did not enter the lower Quinnipiac Valley until some time after the ice had retired to the vicinity of Plainville, 24 miles away. Interfingering with the smoothly bedded dune sand are a few lenses of Triassic red gravel or till washed down on the growing dune from the till-covered hill slopes above.

Interpreting a sample from this locality Krynine says:[9]

> A high silt and clay content is characteristic of sediments formed in ponded bodies of water from which the finer grade sizes can not escape. Specimen 19 shows a mixed character (fine grain size, high mica content, high Triassic admixture and relatively high content of very fine sand and silt), and in addition shows horizontal banding and is found on the very border of the lowland and at a much higher level than the other ice-free deposits. High-velocity material in a low-velocity deposit suggests an abrupt decrease in stream velocity immediately before deposition. The field appearance and position of the deposit indicate that it was on the fringe of the basin of sedimentation and was built by high waters rich in Triassic admixture, which, however, reached it only after depositing part of their coarse material near the center of the valley. Partial closure through abutment against the valley border resulted in a high content of fine sand and silt. This sand can be interpreted as a high-level flood-plain border deposit built by exceptional floods. The alternative hypothesis is a marginal valley deposit at approximately the same level with the main surface of deposition, away from the main channels of swifter currents and coarser sediments and reached only by sedimentation at times when stream volume and velocity were high. Such an interpretation implies that, at least in the lower part of the Quinnipiac Valley, the orginal surface of "buff" deposition was from ten to 20 feet higher than the present surface and that a considerable amount of "buff" sand has been flushed out of the valley by recent streams.

Needless to say, this deposit, which is assigned an ice-contact symbol on Flint's latest geologic map,[10] shows to what variety of interpretation the glacial sediments of Connecticut have been subjected.

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[6] R. F. Flint, *op. cit.*, pp. 88–89.
[7] P. D. Krynine, *Amer. Jour. Sci.*, 5th ser., 33: 111–139, 1937.
[8] R. J. Lougee, *op. cit.*, p. 34 and Plate IV–B.
[9] P. D. Krynine, *op. cit.*, p. 133.
[10] R. F. Flint, *op. cit.*, Fig. 2. p. 82.

MACROCOSMS IN VITRO

IT is hoped that the writer may be pardoned this rather flamboyant title here used to introduce a few