one-fifth times as long as the head, clothed in a thin membrane. Various segments not clearly distinguishable, a few faint constrictions dividing it into four obvious joints; first, bowl shaped, wider than long; second, third and fourth longer than the first; the last segment about 3 times as long as the first.

Head—light yellow, rounded above eyes, almost as long as broad; cheeks parallel, eyes short. Hairs on the head very minute, one hair on each side below the lateral profile of the eyes. Mouth-cone not visible. Length 120μ; width 126μ; width across eyes 113μ.

Prothorax—longer and wider than the head but wider than long. Sides subparallel with anterior and posterior angles rounded. Length 130μ; width 160μ; one very small hair each side behind the coxæ and two short hairs 23μ situated at the posterior corners.

Pterothorax—longer than the head or prothorax, almost as long as the breadth of prothorax, wider than long. Length 166μ; width 186μ; Hairs very minute are situated on the sides.

Legs—not well differentiated into different parts. Length of fore, mid and hind legs almost equal.

Abdomen—pale yellow, fusiform, wider anteriorly and gradually tapering posteriorly ending in a blunt point. Segments not so clearly differentiated as in the larvæ. Length and (Breadth) of 1–7 segments are 40 (176)μ; 66 (186)μ; 73 (210)μ; 73 (220)μ; 76 (220)μ; 83 (210)μ; 70 (196)μ. Hairs on the abdominal segments are very minute. Each segment has a short lateral hair, the length of these from 1–5th segments being 23μ; on the sixth and the succeeding segments the hairs are longer, about 43μ. Some minute hairs are also situated on the dorsum. On the ninth segment at the posterior part, a short distance from the tip, are visible four short, strong thorn-like yellowish spines (25μ long × 8μ wide at the base). The thorn-like spines at the posterior part of ninth segment with undifferentiated antennæ lying in front of the head differentiates it from the larval and pupal stages.

<div align="right">U. S. SHARGA.</div>

Govt. Agricultural College,
    Cawnpore,
      October 5, 1934.

The Multiplication of Scientific Societies.

THE well-meaning letter of Dr. Gilbert J. Fowler under the above heading, appearing in the September number of *Current Science*, does not appear to take sufficient account of the geographical difficulties in India, to which he incidentally refers. The need for the multiplication of local societies in this country like the Biochemical Society, Calcutta, is both great and urgent.

The formation of such regional bodies does not mean that opinion is against the existence of a central body, which, in fact, is necessary for co-ordinating research, preventing isolation as well as overlapping, issuing publications, etc. How exactly this co-ordination can be effected is a matter of detail.

As regards Biochemistry, I think, it should develop as a full-fledged independent science in this country as elsewhere, through its own organisations. There is unfortunately still a tendency in India to make it subordinate to Chemistry, Biology or Medicine. This does not appear to be in the interest of the science, although Biochemistry must necessarily be intimately connected with chemistry and the biological sciences.

<div align="right">B. C. GUHA.</div>

P. 109, Lake Road,
    Calcutta,
      October 3, 1934.

I REGRET that Dr. Guha's letter seems to ignore the essential point that I strove to make in my letter in your September issue under the above heading. I wished to stress the importance above all things of a unity of interest in science to which geographical difficulties *should* be incidental.

In the case of Biochemistry the Society of Biological Chemists, India, having its headquarters in Bangalore where Biochemistry was first systematically taught in this country, has not sought in any way to work independently of existing organisations. Nevertheless, it has held valuable meetings, has published some useful monographs and Annual Reports and has a flourishing Branch centre in Bombay. It holds its Annual Meeting on the occasion of the Science Congress and has in fact so far represented the interests of biochemical workers throughout India. Its President is a distinguished Calcutta scientist and the

Executive Committee contains representatives from seven centres in addition to Bangalore. The contributors to the annual summary of Biochemical and Allied Research in India are equally representative.

The necessity, therefore, for a new Society is difficult to understand.

GILBERT J. FOWLER.

Bangalore,
October 8, 1934.

Research Notes.

On the Class-number of the Imaginary Quadratic Field.

RECENTLY Heilbronn (*Quarterly Journal of Mathematics*, **5**, 150) has proved an old conjecture of Gauss which remained unproved for more than a century. The knowledge about the class-number and the structure of the class-group of an algebraic field are of great importance in the theory of algebraic numbers. They certainly increase our knowledge of higher arithmetic. Unfortunately we know very little about them. Even in the case of the simplest fields such as the quadratic and cyclotomic fields very little is known. The latter field is important in connection with the great theorem of Fermat. The case of the imaginary quadratic field is very interesting as it is connected with many other branches of mathematical analysis. For instance, the equation of the singular moduli of elliptic functions is of degree equal to the class-number $h(-d)$ of the field $K(-\sqrt{d})$ where the ratio of the periods of the elliptic function belongs to $K(\sqrt{-d})$. The Galois group of the equation is isomorphic with that of the corresponding class-group. Gauss conjectured that $h(-d) \to \infty$ as $d \to \infty$. He also proved that the highest power of 2 contained in $h(-d)$ is 2^{t-1} where t is the number of odd prime factors of d. Dirichlet gave a finite expression for the class-number in terms of quadratic residues which he proved by transcendental methods. This is considered by most mathematicians as one of the most beautiful results in mathematics. That was the first time when transcendental methods were employed in the theory of numbers and this has grown to be a separate branch of mathematics since thirty years. There was great development in this branch especially during the past twenty-five years. After fruitless attempts by many scholars, Heilbronn has proved the first conjecture of Gauss by transcendental methods. Now Chowla (*Proc. Indian Acad. Sci.*, 1934, 1) by sharp-

ening his methods slightly, proved that $\dfrac{h(-d)}{2^{t-1}}$ also tends to ∞ with d which includes another hypothesis of Gauss and Euler. This means that the degree of the equation of singular moduli tends to ∞ with d. Incidentally this also shows those values of d for which the equation is solvable by means of quadratic radicals only are finite in number. It is interesting to find out whether there are only 65 of them as was conjectured by Gauss and Euler. It appears that the upper bound of d obtained by these methods will be far greater than 1848 the highest number that Gauss has given.

K.V.I.

Zur Auflösbarkeit der Gleichung $x^2 - Dy^2 = -1$.

IT is known that the diophantine equation $x^2 - Dy^2 = 1$ has an infinite number of solutions for every value of D, but the equation $x^2 - Dy^2 = -1$ does not always possess a solution. A necessary condition for this is that it should be expressible as the sum of two squares but this is by no means sufficient. We have of course the continued fraction condition but this is neither a satisfactory one nor is it simple. The question of its solvability is important in connection with the class number and class field of $K(\sqrt{D})$. Epstein (*Jour. fur. Math.*, **4**, 171) treats this problem by very elementary methods and obtains the necessary and sufficient condition to be as follows. There should exist rational integers a, β, γ, δ, such that $D = \beta^2 + \gamma^2$, $K\beta - \gamma\delta 1 = 1$, and $a^2 + \gamma^2$ is a square. Some other allied results are also given in the paper.

K.V.I.

Lineare Räume mit unendlich vielen Koordinaten und Ringe unendlicher Matrizen.

KOTHE and Toeplitz have contributed a very interesting and thoroughly developed paper (*Jour. fur. Math*, 1934, **4**, 171) on linear spaces with an infinite number of