## Curious Australian Implement

In NATURE, vol. xii. p. 544, a correspondent points out the resemblance existing between an implement used by the Ute Indians and one belonging to the Australian natives, which he calls a vermin hook. May I venture to suggest that he may possibly have mistaken the use of the latter? It appears to me to be identical with the instrument used by all the Australian "river" blacks to throw their light reed spears with, which consist of a heavy miall wood point and a shaft of reed. The bone hook is inserted in the head of the reed, the spear resting between the forefinger and thumb of the hand that holds the thrower and lying parallel to it, thus :—
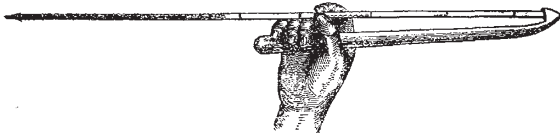
the spear being propelled from the hooked end of the thrower, which is rapidly brought forward into a vertical position, thus propelling the spear before it. During several years on the different Australian rivers, I saw the weapon universally used as above, but neither there nor elsewhere in the colonies for any other purpose.　　　　　　　　　　　　　　　J. P. GLOVER

Derby, Oct. 29

OUR ASTRONOMICAL COLUMN

VARIABLE STARS.—The following are the Greenwich mean times of geocentric minima of Algol, occurring before 14h., to the end of the present year, according to the elements employed by Schönfeld for his later ephemerides :—

	h. m.		h. m.		h. m.
Nov. 14 ...	11 42	Dec. 4 ...	13 24	Dec. 27 ...	11 57
,, 17 ...	8 30	,, 7 ...	10 13	,, 30 ...	8 46
,, 20 ...	5 19	,, 10 ...	7 2		

The first heliocentric minimum in 1876, with the epoch and period of Schönfeld's second catalogue of variable stars (1875), occurs on January 2, at 5h. 34·5m. G.M.T., or January 2·23226 ; the minima throughout the year will be obtained by the successive addition of $2^{d}·86729$. For times of geocentric minima, corrections must be applied to the times so calculated, which may be found from

Corr. to heliocentric minimum = 7·67m. R. sin. (S + 35°·69),

where R is the earth's radius-vector at the date, and S the sun's longitude.

The period of Algol, which had diminished since 1782, at first slowly, but afterwards more rapidly, after remaining constant or nearly so for a time, appears to be again slowly diminishing.

According to Schmidt, of Athens, the brightness of Algol is equal to that of δ Persei about 47 minutes before and after minimum, to that of ε Persei about 62 minutes before and after the same, and to that of β Trianguli 95 minutes before and after. The fluctuations extend over about 9¼ hours.

There is a suspicion of variability about the light of the small companion of this star, first remarked by Schroeter. Smyth measured it in 1835. During the last two years it has sometimes been readily visible and at others discernible with difficulty with the same instrument ; but a systematic course of observations is required to decide if there be a real variation.

According to Schönfeld, S Cancri will be at a minimum on Nov. 14 at 16h. 50m., Dec. 3 at 16h. 3m., and Dec. 22 at 15h. 17m. G.M.T.

For U Geminorum it appears very difficult to make a prediction likely to be of any service, so that very frequent examination is necessary for the determination of the times of maximum. Mr. Otto Struve states that this object does not usually disappear in the Pulkova refractor. Schönfeld thinks the period varies between 70 and 150

days. A secondary minimum has been remarked on several occasions about the time of greatest light. In most periods the star has not continued visible in ordinary telescopes more than a fortnight, and occasionally less. Winnecke has given a list of the small stars in the vicinity of U Geminorum, which will be useful in its identification (See *Astron. Nach.*, No. 1,120). At maximum this star is a little brighter than an average ninth magnitude in Bessel's scale.

THE MINOR PLANETS.—There are this week three additional discoveries to record. No. 151, by Palisa, at the Observatory of Pola on the Adriatic on Nov. 1, place at 13h. 24m. local mean time in R.A. 3h. 2m. 17s., and N.P.D. 71° 40' ; No. 152, by Paul Henry, at Paris on Nov. 2, place at 11h. in R.A.2h. 38m. 17s., N.P.D. 74° 35' ; and No. 153 by Palisa, on Nov. 2, place at 12h. 40m. in R.A. 3h. 1m. 28s., N.P.D. 72° 25' ; all three are of the twelfth magnitude, or somewhat fainter. In Prof. Tietjen's Berlin Circular he transposes the above numbers for the planets discovered on Nov. 2, but upon what ground does not appear ; according to the times of observation given in the first announcement of discovery, the Paris planet should precede that detected at Pola. No. 150, which was found by Watson at Ann Arbor on Oct. 19, soon after his return from Europe, has been observed at Berlin, Düsseldorf, Leipsic, and Pola, and No. 151 on the night after discovery, at Berlin.

Though in certain cases it may be necessary to use caution in announcing the discovery of a new small planet, the actual positions of several of those already observed being very imperfectly known, there appears every probability that the three just brought to light are really new. No. 138 (Tolosa) is probably near the ecliptic in 3h. R.A., but some thirteen or fourteen degrees to the east of Palisa's objects, as will be found from the elements of Gruber, calculated upon the six weeks' observations in June and July 1874. The rough approximations to the orbits of Dike and Camilla at present obtained, place the former in the 5th hour of R.A., and upwards of 34° N. of the equator, and the latter at the beginning of the 4th hour, but at a considerable distance from the ecliptic, or with a N. declination of 8° or 9°. The position of No. 137 (Meliboea) is open to great uncertainty, the observations so far published extending over sixteen days only, and an orbit founded upon them would be of little service so long after the date of observation. A circular orbit appears to have been computed by Dr. Becker at the time, as he published a short ephemeris in the *Astronomische Nachrichten*—but the elements were not appended. Even with the shortest period yet assigned to any member of this group of planets, Meliboea would hardly be so far advanced in R.A. at the present time.

No. 97 (Clotho), in opposition on Nov. 9, is now very little below an eighth magnitude in Argelander's scale. The calculated places for Berlin midnight are—

		h. m. s.			° ′
Nov.	12	R.A. 3 22 2	N.P.D.	93 30
,,	16	,, 3 19 1	,,	93 52
,,	20	,, 3 16 2	,,	94 9
,,	24	,, 3 13 12	,,	94 20
,,	28	,, 3 10 35	,,	94 24

BESSEL'S WORKS.— With No. 2,061 of the *Astronomische Nachrichten*, Dr. Engelmann, formerly attached to the Observatory of Leipsic, issues a prospectus of an important astronomical publication, entitled "Abhandlungen von Friedrich Wilhelm Bessel," in which it is intended to reprint a selection of upwards of 130 of the more important papers, &c., of the great Königsberg astronomer. Many of these are now scattered in works which are often costly and difficult to procure, and the proposed collective edition of the principal memoirs cannot fail to be of vast service to the astronomical student. The selection which has been made will be contained in three

volumes, the first of which is to appear in the present month, the second in the spring, and the third during the summer of 1876, and will be arranged under the following divisions :—(1) Motions of the Bodies of the Solar System ; (2) Spherical Astronomy ; (3) Theory of Instruments ; (4) Stellar Astronomy ; (5) Mathematics ; (6) Geodesy ; (7) Physics, and (8) Various. A portrait and short life of Bessel is to be attached to the first volume. Dr. Busch's complete list of Bessel's works, inclusive of astronomical notes in various scientific periodicals, the *Monatliche Correspondenz* of Zach, the *Berliner Jahrbuch*, &c., which is appended to vol. xxiv. of the Königsberg Observations, contains 385 titles ; but many of the shorter contributions being of minor or ephemeral interest, it is probable that the selection proposed will include all the writings of the illustrious astronomer which can now possess value.

AMONG THE CYCLOMETERS AND SOME OTHER PARADOXERS *
II.

MR. H. HARBORD, who hails from Hull, has put forth three letters, with which we have been favoured. "The Circle Squared" (in November 1867) has, we guess, been noticed by Prof. De Morgan. There is a nicely drawn diagram, two concentric circles, two squares, said to be their respective equivalents, all in black ; an equilateral triangle and its circumscribing circle in red ink ; the former is described on a side of the smaller square, and the red circle passes through the extremities of the same side. A statement is made, which appears to be a statement and nothing more, for it proves nothing. From "Squaring the Circle" (April 15, 1874) we learn that the writer has leisure (*fons et origo mali!*), and so has ventured to amuse himself by considering the relation of the equilateral triangle, the square, and the circle. He obtains the positive altitude of an equilateral triangle on a side of the square to be 7·75448559771125, and requires the exact side of the square and the proportion of the triangle to the square and the equivalent circle. He winds up, like many of his race, with the following reflections :—" I think if the learned in geometry, mathematics, and trigonometry, abandoned approximating theories, and would take the trouble to elucidate the above-stated propositions, they would undoubtedly be able to subvert all anomalous and vague theorems, free the study of geometry, &c., from ambiguity, enable tutors to explain correctly, remove burthens imposed on the mind of the pupil, and establish a system of teaching which shall be correct and intelligible, for it is evident the result of minute calculations proves there is no mystery in geometry, mathematics, or trigonometry ; they are uniform, and may be more easily taught and comprehended with perfect truthfulness without approximation." To prevent trouble, this man of leisure appends the rule ; it is : Add one-seventh to the altitude, and we get the base ; and so on. Not satisfied with the above remarks, we have a note to the "learned" (see above) ; and it is the following curious sentence :—" It is worthy of remark, and more especially to those who are interested in the forthcoming 'Transit of Venus,' when the true distance of the earth from the sun is to be determined, and a difference of about three millions of miles accounted for, to be in a position to prove the fact. Now all this can be accomplished by anxious, minute observation and correct calculation !" He then appends (we don't see the connection) : "Length of an arc of one degree, ·017 . . . to twenty-seven places final." We got the last communication a few days ago ; it is, "Construction of the Perfect Ellipse" (Dec. 22, 1874). This is a fine large figure on a sheet of paper some eighteen inches by fourteen. He finds that the true

* Concluded from vol. xii. p. 560.

ellipse is only to be described on the perpendicular of the equilateral triangle. Mr. Harbord has evidently an idea, and that is, that the equilateral triangle is the key to unlock many geometrical mysteries.

Mr. Michael Callanan, of Cork (September 1874), "is in a position to demonstrate before any appointed number of scientific gentlemen, the perfect quadrature of the circle, rendering it as clear as the most simple, plain (*sic*) rectilineal figure. The Circle, that colossal mystery, to prove the area of which has been looked upon as the climax of geometrical science ; and, although the object of search by the mathematicians of all nations, their greatest efforts have failed ; every attempt, as yet, to square the circle being undemonstrable, and offering no reward to the anxious investigator beyond mechanical or approximate measurement—a manipulation of the great problem. My solution will be found original and thoroughly demonstrative in all its details, without having anything whatever to do with the given or polygonal rules for approximation. Entirely new ground is opened up in the path of science which I have chosen, guided only by positive mathematical laws, combined in the most strict logical arrangement, and thus *proved to demonstration*. I now proclaim the absolute fact of being able to set aside for ever any further doubt as to the complete quadrature of the circle, and thereby confound those scientific prophets who pronounced it an impossibility." Local circumstances offer many impediments in bringing the matter before the scientific world, and "being a geometrical secret, the law of Patent cannot be applied." He then puts himself in the same position with other inventors and discoverers, but he asks for an accredited tribunal "from which I would ask an impartial hearing, so as to verify these statements, and also to be identified and protected as the discoverer." For this end he is willing to attend at any selected place in England, Ireland, or Scotland. He then glances at some of the immediate results in the realisation of this problem. "At the proper time will be published a comprehensive work, including all the new diagrams necessary to carry out and complete the demonstration." And this is all we know of Mr. Callanan's "Secret of 'the Circle' solved."

Our next claimant for notice is not a Circle-squarer, but he would certainly have got a warm corner in the "Budget." Middleton's "new process of measuring the height of the sun," an observation for latitude demonstrated by geometry, proving the sun's height less than the latitude of observer. On this leaflet our paradoxer says, "the sun's height is under 3,000 miles." The principles of this discovery are published in the *West Londoner*. Mr. Empson E. Middleton, *Poet* (Naval and Military Club), sends us a further document (May 5th, 1873) : "£100 Reward to the first who disproves the following Diagram—Middleton's Geometrical Proof that the Earth is Flat." Proof is said to turn upon the SPHINX SOLUTION,—" a globe demands six cardinal points." Having disposed of this point to his satisfaction, he "challenges all the mathematicians to support their statement that a perpendicular line and a line at right angles are the same ; one is *flat*, the other *upright*. I undertake to prove that the perpendicular line is *not* the same as a line at right angles, though the two are utterly confused in every school-book of the day. I undertake to meet in public and to confute any of our mathematical professors who may have the manliness to come forward and discuss this question of the perpendicular, a question which forms the fundamental basis of the whole science of geometry, and is of the very first importance. I remain faithfully, to the Majesty of Truth." Mr. Middleton has published a translation of "the first two books of the Æneid of Virgil" to supersede Mr. Connington's (*sic*) : he has a work "On Space" unpublished, and one "On Man" awaiting demand.

Naturally, after this we should turn to Parallax, or to