Suppose $BC > BP$.

Then $\angle BPC > \angle BCP$.

Also $\angle BPC + \angle BCP = \angle ABC$

and so $\angle BCP < \frac{1}{2}\angle ABC$.

Similarly $\angle CBQ < \frac{1}{2}\angle ACB$.

Therefore $\angle BRC > 180^\circ - \frac{1}{2}\angle ABC - \frac{1}{2}\angle ACB$

i.e. $\angle BRC > 90^\circ + \frac{1}{2}\angle A$.

Since we made $\angle BRC$ equal to $90^\circ + \frac{1}{2}\angle A$, the supposition cannot be true. Similarly we can prove that the supposition $BC < BP$ is untenable.

Hence $BC = BP$, which completes the proof.

The use of cross ratios, a projective tool, seems rather out of character in a problem of this nature, but I have been unable to find any simpler way of proving (1).

The problem of constructing a triangle given $(a + b)$, $(b + c)$ and $\angle A$ has a similar solution.

T. E. Easterfield

2938. On note 2921

1. Morley's conjecture in Note 2921 that if $2^n - 1 = p$ is prime then $2^p - 1$ is also prime is false. The electronic computer in Urbana Illinois showed that although $2^{13} - 1 = 8191$ is prime, $2^{8191} - 1$ is composite; the computer took about 40 hours to show this, and as far as I know the result was not checked.

Budapest Paul Erdös

2. Some of the numbers in G. H. Morley's conjecture were tested in Toronto on the new IBM 704 Data Processing System, with the following results.

657,710,813 is prime.

1,161,737,179 = 1559 × 745181

2,147,483,647 is prime.

For each number the initial programming took less than an hour, and the machine time was less than 5 minutes.

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3. Morley's conjecture that $2^p - 1$ is prime if $p = 2^n - 1$ is prime was proposed by E. Catalan (Mélanges Math. Bruxelles, 1 (1885), p. 147. Cf. L. E. Dickson, History of the Theory of Numbers,