$$H'_{n+1} = \sum_{k=0}^{n} H_k 2^{n-k} = H_n + 2H'_n = 2^{n+1}H_2 - 2H_{n+2} + H_n = 2^{n+1}H_2 - H_{n+3} .$$

Thus (A) holds for all $n \geq 1$. To obtain the identities given by Carlitz, we note that $F_2 = 1$, $L_2 = 3$.

Also solved by Herta T. Freitag, D. V. Jaiswal (India), Bruce W. King, C.B.A. Peck, A. C. Shannon (Australia), David Zeitlin, and the proposer.

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ERRATA

Please make the following correction in the October Elementary Problems and Solutions: In the third equation from the bottom, on p. 292, delete

$$\frac{F_{2k}}{F_{2k+2}} < \frac{F_{2k}}{F_{2k+1}} < \frac{F_{2k+1}}{F_{2k}} < \frac{F_{2k-1}}{F_{2k}}$$

and add, instead,

$$\frac{F_{2k}}{F_{2k+2}} < \frac{F_{2k+2}}{F_{2k+3}} < \frac{F_{2k+1}}{F_{2k+2}} < \frac{F_{2k-1}}{F_{2k}}$$

* * * * *

[Continued from p. 334.]

Hence, by (13), $p \nmid D'_{2n}$

In each case we have found a reduced arithmetic progression no prime member of which is a factor of a certain D'_{2n}. Hence, by Lemma 1, II), there is an infinitude of composite D'_{2n+1}.

REFERENCES

1. R. D. Carmichael, "On the Numerical Factors of the Arithmetic Forms $\alpha^n \pm \beta^n$," Annals of Mathematics, 15 (1913-1914), pp. 30-70.
2. W. J. LeVeque, Topics in Number Theory, I (1958).

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