THEOREM II. *Let $C_1P_1+\cdots+C_sP_s$ be identically zero, where the P_i are distinct power products each of degree $d>0$ in a nonzero F and its derivatives. Then each C_i is in the perfect ideal generated by F.*

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ON THE NON-EXISTENCE OF ODD PERFECT NUMBERS OF FORM $p^\alpha q_1^2 q_2^2 \cdots q_{t-1}^2 q_t^4$

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One of the oldest unsolved mathematical problems is the following one: Are there odd perfect numbers?[2] If such a number n exists, it must have the form

$$n = p^\alpha q_1^{2\beta_1} q_2^{2\beta_2} \cdots q_t^{2\beta_t}$$

where $p, q_1, q_2, \cdots, q_t$ are primes and $p\equiv\alpha\equiv 1 \pmod 4$. This has been proved by Euler.[3] Sylvester[4] obtained estimates for t, in particular $t\geqq 4$, and $t\geqq 7$ if $n\not\equiv 0 \pmod 3$. Recently, it was shown by R. Steuerwald[5] that the case $\beta_1=\beta_2=\cdots=\beta_t=1$ is impossible, and by H. J. Kanold[6] that the same is true for $\beta_1=\beta_2=\cdots=\beta_t=2$. Moreover Kanold proved that n is not perfect if the greatest common divisor d of $2\beta_1+1, 2\beta_2+1, \cdots, 2\beta_t+1$ is divisible by 9, 15, 21, or 33, and some similar results. All these results deal with the case $d>1$.

In the following, it will be proved that no odd perfect number n of form $p^\alpha q_1^2 q_2^2 \cdots q_{t-1}^2 q_t^4$ exists. Here we have $d=1$. For the proof I use

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[1] The relation of the results of this paper to another paper by H. J. Kanold, *Verschärfung einer notwendigen Bedingung für die Existenz einer ungeraden vollkommenen Zahl*, J. Reine Angew. Math. vol. 184 (1942) pp. 116–124, will be considered in an addendum to be published in the December Bulletin.

[2] For the history of the problem see Dickson, *History of the theory of numbers*, vol. 1, 1919, pp. 1–33.

[3] *Commentationes arithmeticae collectae*, vol. 2, *Tractatus de numerorum doctrina* 1849, p. 514; *Opera postuma*, vol. 1, 1862, pp. 14–15.

[4] *Sur l'impossibilité de l'existence d'un nombre parfait impair qui ne contient pas au moins 5 diviseurs premiers distincts*, C. R. Acad. Sci. Paris vol. 106 (1888) pp. 522–526; *Collected mathematical papers*, vol. 4, 1912, pp. 611–614. *Sur une classe spéciale des diviseurs de la somme d'une série géométrique*, C. R. Acad. Sci. Paris vol. 106 (1888) pp. 446–450; *Collected mathematical papers*, vol. 4, 1912, pp. 607–610.

[5] *Verschärfung einer notwendigen Bedingung für die Existenz einer ungeraden vollkommenen Zahl*, Sitzungsberichte der mathematisch-naturwissenschaftlichen Abteilung der Bayerischen Akademie der Wissenschaften zu München, 1937, pp. 68–72.

[6] *Untersuchungen über ungerade vollkommene Zahlen*, J. Reine Angew. Math. vol. 183 (1941) pp. 98–109.