A series of manuscripts on the social relations of engineering
and related philosophical questions dealing with the interaction
of science and society.  Distribution is limited to reviewers
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possible publication.

### "APPLICATION OF PHILOSOPHY AND SOCIOLOGY TO ESTIMATE REQUIREMENTS FOR NEW COMPUTERS AND/OR TERMINAL  DEVICES."

by

Frederick B. Wood, Ph.D.


(A Continuation of SEPR No. 76-A, Man-To-Computer
Relationship and the Functioning of Civilization.)

"Application of Philosophical and Sociological Information."

The ideal electric energy distribution curves for the U.S.A and the U.S.S.R. are traced from Fig. 4 of SEPR No. 76-A as Fig. I of SEPR No. 77-A. If the countries of Western Europe were added together a curve larger than that for the U.S.S.R. would be obtained.

In the U.S.A. plot, section (I) represents the potential market for the on-line computer controlled intelligence-amplifier system discussed by Dr. Engelbart. The conversion factor to convert the kwh/yr/capita units to computer rental dollars is not known. Without numerical values, these curves at least give an estimate of the type and proportion of the market accesible to economical computer terminal devices. If the U.S.A. market develops to approach the ideal curve, the potential market for the terminal devices is shown by the sum of sections (2A) and (2B), which appears to be much larger than section (I).

**However for the U.S.S.R. which is not as close to maximizaing negentropy in its system, only the central computer for the specialist offers a large market at present. In the U.S.A. condiditons are approaching that where the economical terminal device or low-cost free standing processor is needed to bring computing capability to organizations which heretofore have not been seriously considered.**

The prospects of teaching people of the extreme left and extreme right politically to do computer programming has a profit value to computer manufacturers proportional to $kp$. However the negentropy value to the U.S.A. would be proportional to $-k \cdot p \cdot \log p$.
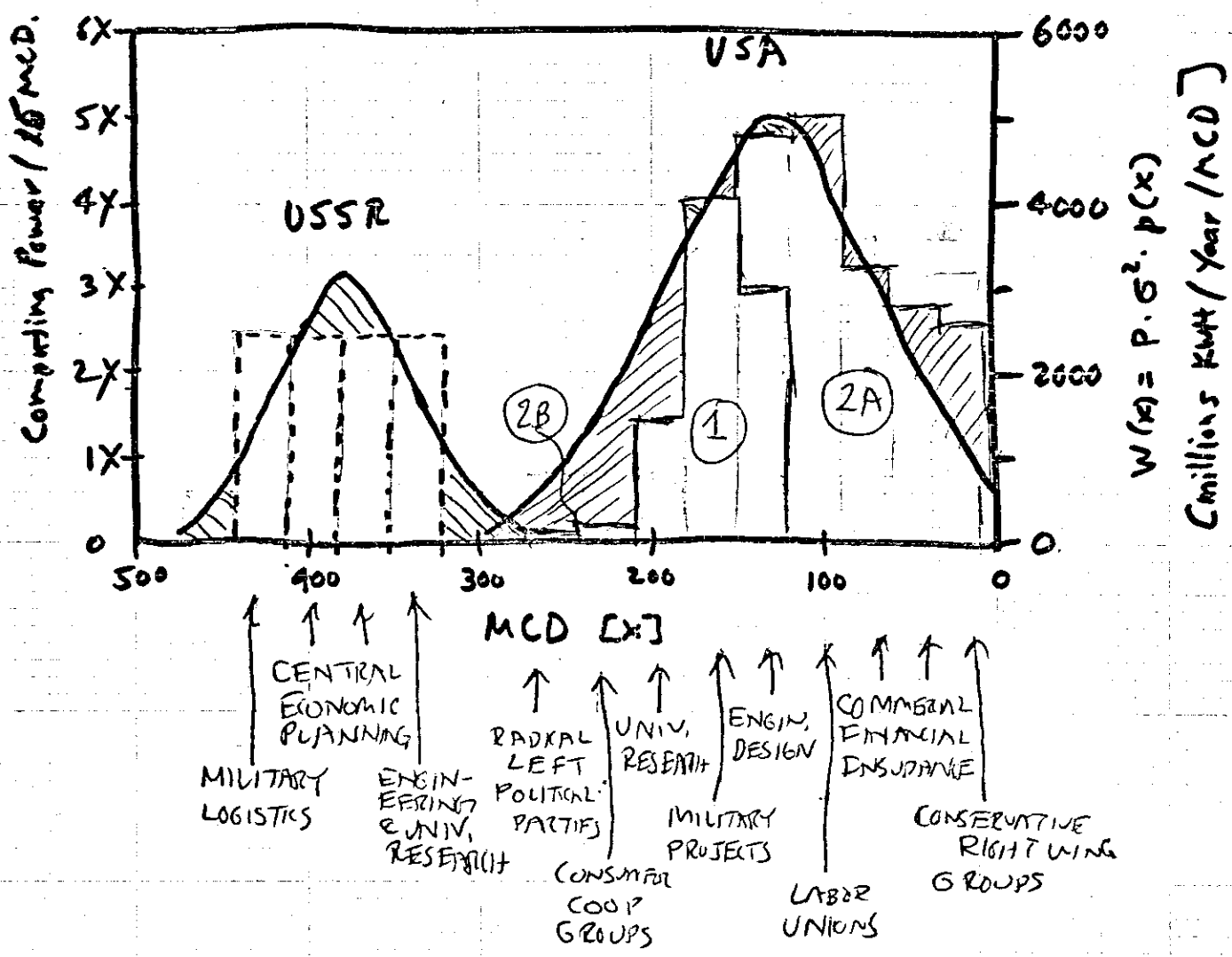
Fig. I. Estimate of Market Potential Upper Bounds From Sociological and Philosophical Factors.

During the transition from the "power era" to "information era"

this factor* of "— log p" can seriously disrupt a capitalist

economic system, if proper adjustment is not made in corporate

planning, government contract policies, and tax structure.

To get some first guess as to the time schedule of the

requirements for man-man, man-machine, man-machine-man, and

machine-machine communications, some estimates of R. L. Meier

are reprinted below in Fig. 2.   Note that the scale is logarithmic

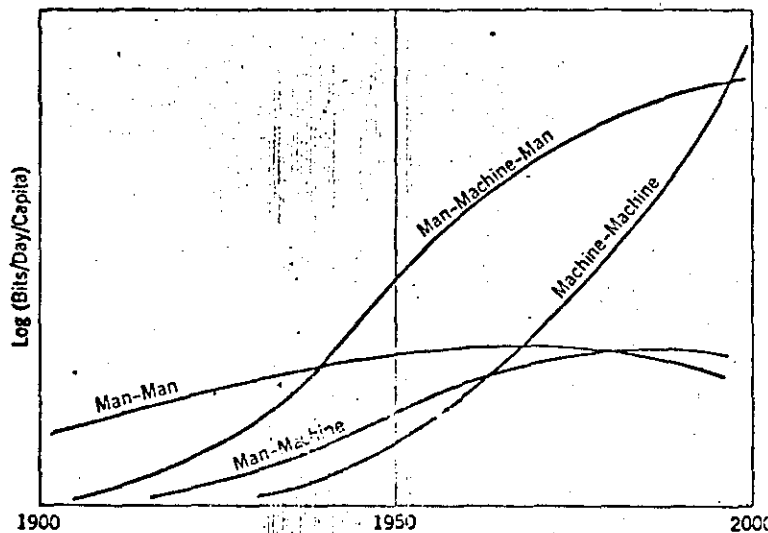and that no reference value is given.



Fig. 2.    Growth of communication.  Redrawn from "Communication and Social Change," Richard T. Meier, *Behavioral Science*, Vol. 1, No. 1, Jan. 1956.

* Difference is:   $-k \cdot p \left( \log p + 1 \right) = kp \left( |\log p| - 1 \right)$

For example, if $p = 2^{-6} = 1/64$ ; $kp = k/64$

Ratio, $R = -\log \left( 2^{-6} \right) = 6$          $-kp \log_2 p = 6 k/64$

Difference, $\Delta H = 5 k/64$

i.e. $\dfrac{\text{Information Age Value (Negentropy)}}{\text{Power Age Value } (= \text{Max Profit})} = \dfrac{6}{1}$       See SEPR No. 92-B Fig 2.