63. *On the Possibility of the Weil's Integral Representation.*

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1. In the space of n complex variables $(z_1, \ldots, z_n)$, we take a closed domain P contained in a domain D. If there exist a finite number of functions $\varphi_1, \ldots, \varphi_m$ regular in D such that $|\varphi_j((z))|<1$, $(j=1, \ldots, m)$ for all points (z) in the interior of P, while at each boundary point of P at least one of them takes absolute unit value, then P is called a polyhedral domain in D.[1] We also assume that $m \geqq n$, and the varieties on its boundary

$$(1) \qquad \sigma_{j_1, \ldots, j_n} = \{(z) : |\varphi_{j_\mu}((z))| = 1\,, \ (\mu = 1, \ldots, n)\}$$

have all at most dimension n. This condition shall be satisfied by suitable translations.

Next we assume[2] that there exist functions $p_{jk}((\zeta); (z))$, $(j=1, \ldots, m; k=1, \ldots, n)$ regular on $(\zeta) \in P$ and $(z) \in P$, satisfying

$$(2) \qquad \varphi_j((\zeta)) - \varphi_j((z)) = \sum_{k=1}^{n} (\zeta_k - z_k)\, p_{jk}((\zeta); (z))\,.$$

We put

$$\Delta_{j_1 \ldots j_n}((\zeta); (z)) = \frac{\begin{vmatrix} p_{j_1 1}, \ldots\ldots, p_{j_n 1} \\ \cdots \quad \cdots \\ p_{j_1 n}, \ldots\ldots, p_{j_n n} \end{vmatrix}}{\prod_{\mu=1}^{n} \left[\varphi_{j_\mu}((\zeta)) - \varphi_{j_\mu}((z))\right]}.$$

Under these conditions, a function $f(z_1, \ldots, z_n)$ regular on P[3] is represented by Weil's integral formula in P[4]

$$(3) \quad f((z)) = \frac{1}{(2\pi i)^n} \sum \int_{\sigma_{j_1 \ldots j_n}} f((\zeta)) \cdot \Delta_{j_1 \ldots j_n}((\zeta); (z))\, d\zeta_1 \ldots d\zeta_n$$

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1) Cf. for example: S. Hitotumatu, Cousin problems for ideals and the domain of regularity, will appear in Kōdai Math. Sem. Reports, vol. **3** (1951).

2) We will discuss this assamption later.

3) This means that f is regular in some neighborhood containing the closure of P.

4) A. Weil: Sur les séries de polynomes de deux variables complexes, C. R. Paris **194** (1932), 1304-5; L'intégrale de Cauchy et les fonctions de plusieurs variables, Math. Ann. **111** (1935), 178-182.