ERRATA, VOLUME XXVII

Yoshiro Mori, "*On the integral closure of an integral domain*", pp. 249—256.

It was wrong that $\bar{\mathfrak{o}}^* \subseteqq \tilde{\mathfrak{o}}^*$. But since $\mathfrak{o}^* \subseteqq \tilde{\mathfrak{o}}^* \subseteqq \bar{\mathfrak{o}}^*$, by the following Lemma 7, if we take $\bar{\mathfrak{o}}^*$ instead of $\bar{\mathfrak{R}}^*$ in the proof of Theorem 1, we can correct the proof of Theorem 1 as follows:

Lemma 7. Let the ring $\mathfrak{R}$ be mapped onto $\tilde{\mathfrak{R}}$ by the ring homomorphism of $\mathfrak{R}^*$ onto $\mathfrak{R}^*/\mathfrak{l}^*=\mathfrak{o}^*$ and $\tilde{K}$ be the quotient field of $\tilde{\mathfrak{R}}$, then $\tilde{K}\cap\bar{\mathfrak{o}}^*=\bar{\tilde{\mathfrak{R}}}$ where $\bar{\tilde{\mathfrak{R}}}$ is the integral closure of the local domain $\tilde{\mathfrak{R}}$ in $\tilde{K}$.

Since any element of $\tilde{K}$ is expressed as $\tilde{a}/\tilde{b}$ where $\tilde{a}$ and $\tilde{b}(\neq 0)\in\tilde{\mathfrak{R}}$, if $\tilde{a}/\tilde{b}\in\bar{\mathfrak{o}}^*$, then $(\tilde{a}/\tilde{b})^m+\tilde{c}_1^*(\tilde{a}/\tilde{b})^{m-1}+\cdots+\tilde{c}_i^*(\tilde{a}/\tilde{b})^{m-i}+\cdots+\tilde{c}_m^*=0$ where $\tilde{c}_i^*\in\mathfrak{o}^*$. Hence $\tilde{a}^m+\tilde{c}_1^*\tilde{a}^{m-1}\tilde{b}+\cdots+\tilde{c}_i^*\tilde{a}^{m-i}\tilde{b}^i+\cdots+\tilde{c}_m^*\tilde{b}^m=0$. Let c_i^*, a, b respectively representatives in $\mathfrak{R}^*$ of the residue classes $\tilde{c}_i^*$, $\tilde{a}$, $\tilde{b}$ where we choose a, b from $\mathfrak{R}$, then $a^m+c_1^*a^{m-1}b+\cdots+c_i^*a^{m-i}b^i+\cdots+c_m^*b^m\in\mathfrak{l}^*$. Hence $(a^m+c_1^*a^{m-1}b+\cdots+c_i^*a^{m-i}b^i+\cdots+c_m^*b^m)^\rho=0$, provided $\mathfrak{l}^{*\rho}=(0)$, and also $a^M+d_1^*a^{M-1}b+\cdots+d_i^*a^{M-i}b^i+\cdots+d_M^*b^M=0$ where $d_i^*\in\mathfrak{R}^*$. This shows that a^M is in $(a^{M-1}b, \cdots, a^{M-i}b^i, \cdots, b^M)\mathfrak{R}^*$ and therefore in $(a^{M-1}b, a^{M-2}b^2, \cdots, a^{M-i}b^i, \cdots, b^M)\mathfrak{R}^*\cap\mathfrak{R}=(a^{M-1}b, \cdots, a^{M-i}b^i, \cdots, b^M)\mathfrak{R}$. Thus we can write $a^M+d_1a^{M-1}b+d_2a^{M-2}b^2+\cdots+d_ia^{M-i}b^i+\cdots+d_Mb^M=0$ where $d_i\in\mathfrak{R}$ and also $\tilde{a}^M+\tilde{d}_1\tilde{a}^{M-1}\tilde{b}\cdots+\tilde{d}_i\tilde{a}^{M-i}\tilde{b}^i+\cdots+\tilde{d}_M\tilde{b}^M=0$ where $\tilde{d}_i$ are the residue classes of d_i modulo $\mathfrak{l}^*$. Hence $\tilde{a}/\tilde{b}\in\bar{\tilde{\mathfrak{R}}}$ and $\bar{\tilde{\mathfrak{R}}}\subset\bar{\mathfrak{o}}^*$ because every element of $\mathfrak{R}$ is a non-zero-divisor in $\mathfrak{R}^*$. This completes the proof of our Lemma 7.

Proof of Theorem 7.

If α is an element of $\mathfrak{R}$, α is a non-zero-divisor in $\mathfrak{R}^*$. Let $\tilde{\alpha}$ denote the residue class of $\alpha\in\mathfrak{R}^*$ modulo $\mathfrak{l}^*$. Then $\tilde{\alpha}\bar{\mathfrak{o}}^*$ can be expressed as a finite intersection of symbolic powers of minimal prime ideals by Proposition 3. If $\tilde{\alpha}\bar{\mathfrak{o}}^*=\cap Q_{ij}^*$ is an irredundant intersection of symbolic powers of minimal prime ideals, we put $Q_{ij}^*\cap\bar{\tilde{\mathfrak{R}}}=\bar{\tilde{\mathfrak{q}}}_{ij}$. Then $\tilde{\alpha}\bar{\tilde{\mathfrak{R}}}=\cap\bar{\tilde{\mathfrak{q}}}_{ij}$ by Lemma 7. As we may assume that $\tilde{\alpha}\bar{\tilde{\mathfrak{R}}}=\underset{\lambda}{\cap}\bar{\tilde{\mathfrak{q}}}_\lambda$ is an irredundant intersection of primary ideals $\bar{\tilde{\mathfrak{q}}}_1, \bar{\tilde{\mathfrak{q}}}_2, \cdots, \bar{\tilde{\mathfrak{q}}}_r$, the prime ideals $\bar{\tilde{\mathfrak{p}}}_i$ belonging to the primary ideals $\bar{\tilde{\mathfrak{q}}}_i$ is a minimal prime ideal in $\bar{\tilde{\mathfrak{R}}}$. For, if we assume that $\bar{\tilde{\mathfrak{p}}}_i$ is not minimal in $\bar{\tilde{\mathfrak{R}}}$, similarly to the proof of Prop 3, $(\bar{\tilde{\mathfrak{p}}}_i)^{-1}\supset\bar{\tilde{\mathfrak{R}}}$, and $(\bar{\tilde{\mathfrak{p}}}_i)^{-1}(\bar{\tilde{\mathfrak{p}}}_i)=\bar{\tilde{\mathfrak{p}}}_i$. Hence, if $\tilde{x}\in(\bar{\tilde{\mathfrak{p}}}_i)^{-1}$ and $\tilde{x}\notin\bar{\tilde{\mathfrak{R}}}$, then $\tilde{x}\bar{\tilde{\mathfrak{p}}}_i\in\bar{\tilde{\mathfrak{p}}}_i$ and also $\tilde{x}^N\bar{\tilde{\mathfrak{p}}}_i\in\bar{\tilde{\mathfrak{p}}}_i$ $(N=1, 2, \cdots, n, \cdots)$.

Therefore, there is an element $\tilde{\rho}$ in $\bar{\bar{\mathfrak{R}}}$ such that $\tilde{\rho}\tilde{x}^N\in\bar{\bar{\mathfrak{R}}}$ ($N=1, 2, 3, \cdots$). Hence $\tilde{\rho}\tilde{x}^N\in\bar{\mathfrak{v}}^*$ and also $\tilde{x}\in\bar{\mathfrak{v}}^*$ by Prop. 3. Therefore, $\tilde{x}\in\bar{\bar{\mathfrak{R}}}$ by Lemma 7. This is a contradiction. Hence $\bar{\bar{\mathfrak{p}}}_i$ is a minimal prime ideal in $\bar{\bar{\mathfrak{R}}}$. It follows that $\bar{\bar{\mathfrak{R}}}$ is an "Endliche diskrete Hauptordnung." On the other hand, $\mathfrak{R}$ is clearly isomorphic to $\tilde{\mathfrak{R}}$ and also $\bar{\mathfrak{R}}$ is isomorphic to $\bar{\bar{\mathfrak{R}}}$. This implies that $\bar{\mathfrak{R}}$ is an "Endliche diskrete Hauptordnnug". This completes the proof of our Theorem 1.