

In 1917 Mirimanov constructed the *cumulative collection of sets*  $V_\alpha$  for all ordinals  $\alpha$  such that  $V_0 \equiv \emptyset$ ,  $V_{\alpha+1} = V_\alpha \cup \mathcal{P}(V_\alpha)$ ,  $V_\alpha = \cup[V_\beta | \beta \in \alpha]$  for limit ordinals  $\alpha$ .

After introducing by Zermelo, Serpinski, and Tarsky (1930) the notion of (*strongly*) *inaccessible cardinal* Zermelo (1930) and Shepherdson (1951) proved that *a set  $U$  is a supertransitive standard model of NBG iff  $U = V_{\varkappa+1}$  for some inaccessible cardinal  $\varkappa$* , where  $U$  is called *supertransitive* iff  $\forall x \in U \forall y((y \in x \Rightarrow y \in U) \wedge (y \subset x \Rightarrow y \in U))$ .

Tarsky (1938) introduced the notion of a *Tarsky set*  $U$  such that  $x \in U \Rightarrow x \subset U$ ,  $x \in U \Rightarrow \mathcal{P}(x) \in U$ ,  $(x \subset U \wedge \forall f(f \in U^x \Rightarrow \text{rng } f \neq U) \Rightarrow x \in U$ .

Tarsky (1938) proved that the set  $V_\varkappa$  for every inaccessible cardinal  $\varkappa$  is a Tarsky set, but the converse was not proved. We prove that *for a set  $U$  the following assertions are equivalent*:

- 1)  $U = V_\varkappa$  for some inaccessible cardinal  $\varkappa$ ;
- 2)  $\mathcal{P}(U)$  is a supertransitive standard model of NBG;
- 3)  $U$  is an uncountable Tarsky set.

The theorem of Zermelo–Shepherdson gives the canonical form of supertransitive standard models of NBG in ZF. But Montague and Vaught (1959) proved that for every inaccessible cardinal  $\varkappa$  there exists an ordinal  $\theta < \varkappa$ , such that  $\theta$  is not inaccessible and  $V_\theta$  is a supertransitive standard model of ZF.

Every formula  $\varphi(x, y; \vec{p})$  for every set  $A$  assigns the *scheme correspondence*  $[\varphi(x, y; \vec{p}) | A] \equiv \{z \in A * A | \exists x, y \in A (z = \langle x, y \rangle \wedge \varphi^A(x, y; \vec{p}))\}$ . An ordinal  $\varkappa$  will be called *scheme-regular* if  $\forall \vec{p} \in V_\varkappa \forall \alpha (\alpha \in \varkappa \wedge ([\varphi(x, y; \vec{p}) | V_\alpha] : \alpha \rightarrow \varkappa \Rightarrow \cup \text{rng } [\varphi(x, y; \vec{p}) | V_\alpha] \in \varkappa)$  for any formula  $\varphi$  of ZF.

An ordinal  $\varkappa > \omega$  will be called *scheme-inaccessible* if  $\varkappa$  is scheme-regular and  $\forall \alpha (\alpha \in \varkappa \Rightarrow |\mathcal{P}(\alpha)| \in \varkappa)$ .

Every formula  $\sigma(x; \vec{u})$  for every set  $A$  assigns the *scheme subset*  $\langle \sigma(x; \vec{u}) | A \rangle \equiv \{x \in A | \sigma^A(x; \vec{u})\}$  of  $A$ . A set  $U$  will be called a *scheme Tarsky set* if  $x \in U \Rightarrow (x \subset U \wedge \mathcal{P}(x) \in U \wedge \cup x \in U)$ ,  $\omega \in U$ ,  $|U| \in U$ ,  $\forall \vec{p}, \vec{u} \in U \forall \varepsilon (([\varphi(x, y; \vec{p}) | U] : \langle \sigma(x; \vec{u}) | U \rangle \mapsto \varepsilon) \wedge \varepsilon \in |U| \Rightarrow \langle \sigma(x; \vec{u}) | U \rangle \in U)$  for any formulas  $\varphi, \sigma$  of ZF.

We prove that *for a set  $U$  the following assertions are equivalent*:

- 1)  $U = V_\varkappa$  for some scheme-inaccessible cardinal  $\varkappa$ ;
- 2)  $U$  is a supertransitive standard model of ZF;
- 3)  $U$  is a scheme Tarsky set.