References

General. It is difficult to trace exactly the history of a young theory like mathematical structures and categories. In the present notes we restrict ourselves to explaining the sources of various results in our book. The reader interested in the historical background is adviced to consult the fundamental book of one of the founders of the theory of categories:

S. MacLane: *Categories for the Working Mathematician*. Springer-Verlag, Berlin – Heidelberg – New York (1971).

A complete list of publications related to mathematical structures and categories up to 1971 can be found in another important book:

H. Herlich and G. E. Strecker: *Category Theory*. Allyn & Bacon, Boston (1973).

Chapter 1. The term construct is used for the first time in our book. The concept was not derived from the structures of N. Bourbaki (*Theory of Sets*, Hermann, Paris, 1957); Bourbaki's concept is more complicated since all possible "types of structures" are formally described. Rather, constructs are a special case of the so-called concrete categories over a base category $\mathscr{X}$. These are pairs $(\mathscr{K}, U)$, where $\mathscr{K}$ is a category and $U: \mathscr{K} \to \mathscr{X}$ is a faithful functor. Concentrating on the concrete categories over $\mathscr{X} = \textbf{\textit{Set}}$, we obtain constructs. A large number of papers is devoted to concrete categories. Perphaps the earliest work is that of Ch. Ehresmann; see also his monograph: *Catégories et structures* (Dunod, Paris, 1965).

Subobjects, quotient objects and free objects were introduced by N. Bourbaki.

Chapter 2. Initial and final structures are from N. Bourbaki. In topology E. Čech studied them under the term projective and inductive generation. The results of the first three sections are from N. Bourbaki or from folklore. The duality theorem 2C2 is due to

Ph. Antoine: *Etude élémentaire des catégories d'ensembles structurés*. Bull. Soc. Math. Belgique *18* (1966) 141 – 164.

The semifinal objects were discovered independently by

R.-E. Hoffman: *Semi-Identifying Lifts and a Generalization of the Duality Theorem for Topological Functors*. Math. Nachrichten *74* (1976) 295 – 307,

(which is the source of theorems 2D4, 2Dc and 4C4) and by

V. Trnková: *Automata in Categories*. Lecture Notes in Computer Science 32. Springer-Verlag, Berlin – Heidelberg – New York (1975) 138 – 152.

For singleton sinks, this concept was studied by Ch. Ehresmann (Math. Annalen *171* (1967) 293 – 363) and by O. Wyler (Topology and its Appl. *3* (1973) 149 – 160).

The criterion 2E3 is probably new.

Chapters 3. and 4. Historical information can be found in the book of S. MacLane, mentioned above. For the section on reflective subcategories see

H. Herrlich: *Topologische Reflexionen und Coreflexionen*. Lecture Notes in Mathematics 78. Springer-Verlag, Berlin – Heidelberg – New York (1968).

The section on tensor products was inspired by

B. Banaschewski and E. Nelson: *Tensor Products and Bimorphisms*. Canad. Math. Bull. *19* (1976) 385 – 402.

Chapter 5. The embedding mentioned in the introduction is due to J. Rosický.

A: Set functors are investigated in a number of papers by V. TRNKOVÁ and V. KOUBEK. For example, V. TRNKOVÁ: *On Descriptive Classification of Set Functors.* Comment. Math. Univ. Carolinae *12* (1971) 144–174 and 345–357,
V. KOUBEK: *Set Functors.* Comment. Math. Univ. Carolinae *12* (1971) 175–195.
The former paper is the source of Proposition 5A4 and Theorem 5A9, and the latter is the source of Proposition 5A10. Theorem 5A7 is from
J. ADÁMEK, V. KOUBEK and V. POHLOVÁ: *The Colimits in the Generalized Algebraic Categories.* Acta Univ. Carolinae Math. Phys. *13* (1972) 29–40.

B: Relational structures with types expressed by set functors were introduced by the "Prague school", see for example
Z. HEDRLÍN, A. PULTR and V. TRNKOVÁ: *Concerning a Categorical Approach to Topological and Algebraic Categories.* Proceedings of the Second Prague Topological Symposium. Academia, Praha (1966) 176–181.
The main result, Corollary 5B9, as well as Proposition 5B7 are due to
L. KUČERA and A. PULTR: *On a Mechanism of Defining Morphisms in Concrete Categories.* Cahiers Topo. et Géo. Diff. *13* (1972) 397–410.
However, our proof of 5B9 (which is based on Theorem 5B5) is from
J. ADÁMEK, H. HERRLICH and G. E. STRECKER: *The Structure of Initial Completions.* Cahiers Topo. et Géo. Diff. *20* (1980) 333–352.
Theorem 5B11 is due to
L. KUČERA: *On Universal Concrete Categories.* Algebra Univ. *5* (1975) 149–151.

C: Algebraic constructs were originally defined by
M. BARR: *Coequalizers and Free Triples.* Math. Z. *116* (1970) 307–322.
The iterative construction of free algebras is due to
V. KŮRKOVÁ-POHLOVÁ and V. KOUBEK: *When a Generalized Algebraic Category is Monadic.* Comment. Math. Univ. Carolinae *15* (1974) 577–587
and in the present form to
J. ADÁMEK: *Free Algebras and Automata Realizations in the Language of Categories.* Comment. Math. Univ. Carolinae *15* (1974) 589–602.
The former paper is the source of Theorem 5C6, but the present much simplified proof is from
V. TRNKOVÁ, J. ADÁMEK, V. KOUBEK and J. REITERMAN: *Free Algebras, Input Processes and Free Monads.* Comment. Math. Univ. Carolinae *16* (1975) 339–351.

D: The Birkhoff Variety Theorem is from an unpublished manuscript of V. KOUBEK and the author. A more general result is proved by
J. REITERMAN: *One More Categorical Model of Universal Algebra.* Math. Z. *161* (1978) 137–146,
which is also the source of example 5D6. Theorem 5D2 is due to
W. S. HATCHER: *Quasiprimitive Subcategories.* Math. Annalen *190* (1970) 93–96.

Chapter 6. The concept of a concrete category in the present sense is due to A. G. KUROSH. The first non-concrete category, our Example 6A5, was found by
J. R. ISBELL: *Two Set-Theoretical Theorems in Categories.* Fund. Math. *53* (1963) 43–49.
This is also the source of the Isbell condition. Its sufficiency (6A4) was proved by
P. J. FREYD: *Concreteness.* J. Pure Appl. Algebra *3* (1973) 171–191.
The proof presented above is due to
J. VINÁREK: *A New Proof of Freyd's Theorem.* J. Pure Appl. Algebra *8* (1976) 1–4.
The source of the KUČERA Theorem is
L. KUČERA: *Every Category is a Factorization of a Concrete One.* J. Pure Appl. Algebra *1* (1971) 373–376.
References concerning universal constructs can be found in the monograph of A. PULTR and V. TRNKOVÁ, mentioned at the end of the chapter.