No one likes them, but they don’t appear to be going away. Thanks to a moth found in Navy hardware 30 years ago, errors and unintended side effects have gone under the name “bugs,” and debugging has become a major part in software development and maintenance. What to do? Our two cover articles look at the problem from different approaches: visual aids and knowledge-based assistants. Most software bugs aren’t as pretty as our cover subject, a Peruvian Hyboptera beetle—but they are often as hard to find.

Cover illustration by George Venable, Smithsonian Institution National Museum of Natural History

Cover design by Kevin Reagan

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8 VIPS: A Visual Debugger
Sadahiro Isoda, Takao Shimomura, and Yuji Ono
Testing Ada programs is easier with this visual debugger that graphically depicts what the program is doing—and how it is done.

20 Knowledge-Based Program Debugging Systems
Rudolph E. Seviora
No one likes to debug programs, and there is as yet no way to automate the task. However, knowledge-based approaches offer some possibilities for the future.

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50 Experimental Prototyping in Smalltalk
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