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Kamimura shows that right-handed and left-handed *L. riparia* have equal mating success[6].

Alternatively, right-side penis preference might somehow be connected to the unknown factor that favours a stronger curvature of the right cerci in some related wingless earwigs, for example *Anisolabis* and *Euborellia*[16]. But the cerci in *L. riparia* are symmetrical (Fig. 1a), so the puzzle remains.

Clearly, the earwig penis system warrants more study. It could become a textbook example of how a possibly learnt lateralized behaviour bred a lateralized morphology evolutionarily. It already qualifies as a fine example of a phenotype-precedes-genotype mode of evolution because the right-ready and left-ready penis variants, which are equally common in evolutionary intermediates (Fig. 1c), and therefore probably not heritable[17], clearly existed before the genetically captured right-ready phenotype seen in *L. riparia*. Who would have ever thought you could learn so much from earwig penises? ■

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50 & 100 YEARS AGO

50 YEARS AGO

The major part of the inaugural address as president of the Institution of Electrical Engineers, delivered by Sir Gordon Radley... was devoted to a consideration of world telecommunication, a subject particularly topical in view of the recent opening to traffic of the first trans-Atlantic telephone cable. The practical realization of inter-continental multi-channel telephone communication by submarine cable is, in Sir Gordon's view, revolutionary in its possibilities, because the traffic capacities of such cables are likely to exceed the existing demand for telegraph and telephone facilities on their routes... A new facility is planned for the trunk telephone network of Great Britain in the form of subscriber-dialling of long-distance calls. To render this practicable, it is necessary to have a nation-wide number scheme...
From *Nature* 8 December 1956.

100 YEARS AGO

To conclude, one may quote some admirable remarks... on the unfortunate result of ignorant European interference with Kafir customs... "In olden days there were regular courts of investigation, consisting of a dozen old women of the kraal. All the girls were medically examined by these women before and after large dances; and thus certain forms of vice were impossible as they would be so speedily detected. Nowadays the young women will not submit to such examination... [A]ncient restraints have been removed, and no new ones have been substituted by white men. The result is disastrous... The case of 'mixed bathing' of the children is another example of a somewhat similar thing. According to Western conceptions of morality this practice is indelicate and liable to lead to immorality. So missionaries advised natives to abandon it. The natives now declare that the abandonment of this custom has led to an increase of immorality, and say that it introduces new vices amongst the people."
From *Nature* 6 December 1906.

CHEMICAL BIOLOGY

Renewing embryonic stem cells

Reka R. Letso and Brent R. Stockwell

Embryonic stem cells have great potential in medicine, but the current methods used to grow them prevent their therapeutic use. A dual-action compound has been discovered that may help solve this problem.

Last year, the International Stem Cell Forum stated that a reliable method for growing stem cells that does not depend on animal-derived products is a requirement for future work[1]. Reporting in *Proceedings of the National Academy of Sciences*, Chen *et al.*[2] describe their progress towards this goal. Using high-throughput screening, they have discovered a chemical that allows mouse embryonic stem (ES) cells to perpetuate themselves. This compound is a valuable tool for studying ES cell self-renewal, and may bring us closer to developing these cells for therapeutic purposes.

Great hopes have been raised that ES cells will one day be used to replace damaged cells, and to provide therapies beyond the reach of conventional drugs. However, a serious obstacle to their use is our lack of insight into the mechanisms that regulate a stem cell's behaviour — more specifically, whether it undergoes self-renewal or differentiates to become a more specialized type of cell. Furthermore, most human stem-cell lines, including all human ES cell lines approved for study with US federal funds, were grown using animal products, so the potential for cross-species contamination is too high for these lines to be developed for therapeutic purposes[3]. A synthetic compound that promotes ES cell self-renewal could help to address both of these issues.

Intriguingly, Chen and colleagues' compound — named SC1 — hits two targets in a protein network. Both of these targets are necessary to promote ES cell self-renewal. The authors discovered the compound by high-throughput screening of a chemical library[4] they had designed to target kinase enzymes; kinases pass on signals inside the cell. The authors tested their chemicals in mouse ES cells that were engineered to produce green fluorescent protein (GFP) only when they were perpetuating themselves. For the screen, the cells were grown under conditions that should cause them to stop self-renewing and to differentiate, a process that causes the levels of GFP to drop and the fluorescence to disappear. Chen *et al.* looked for compounds that had the ability to maintain fluorescence under these conditions.

Surprisingly, although the library was designed to target kinase enzymes, only one of the two targets of SC1 is a kinase. This illustrates an interesting notion in the design of chemical libraries: certain chemical groups